

**From:** Karen Clark

**Sent:** Friday, January 7, 2011 10:50 AM

**To:** joe.findaro@akerman.com; Tony Coelho; David L. Bernhardt; Ken Khachigian; [REDACTED]@ [REDACTED] [REDACTED] Ed Manning; Carolyn Jensen; Jason Peltier; sramos@westlandswater.org; Sarah Woolf; Don Peracchi; Tom Houston; Bill Kahrl; Craig Manson

**CC:** Carmela McHenry

**Subject:** PR/Legislation Strategy Session Reminder

All,

This is a reminder that there will be a meeting on Monday, January 10 at 10:00 a.m. to discuss public relations/legislation strategy at the office of KP Communications, 1201 K Street, Suite 800, Sacramento, CA 95814. Lunch will be provided. Additionally, the meeting will last until approximately 4:00 p.m.- 4:30 p.m.

If you have any questions, feel free to contact me on my cell at [REDACTED]

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Friday, January 7, 2011 10:52 AM  
**To:** kclark@westlandswater.org  
**Subject:** RE: PR/Legislation Strategy Session Reminder

karen, presume that tom is not planning anything for after 430 pm? planning to take a 9 pm flight back. THANKS. joe

V Card | Bio | [akerman.com](http://akerman.com)



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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, January 07, 2011 12:50 PM  
**To:** Findaro, Joe (OC-DC); Tony Coelho; David L. Bernhardt; Ken Khachigian; [REDACTED]@[REDACTED]; Ed Manning; Carolyn Jensen; Jason Peltier; sramos@westlandswater.org; Sarah Woolf; Don Peracchi; Tom Houston; Bill Kahrl; Craig Manson  
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**To:** joe.findaro@akerman.com  
**Subject:** RE: PR/Legislation Strategy Session Reminder

Hi Joe,

You are correct. Tom is not planning on anything after 4:30 p.m. and I'm certain he would be fine with you flying back at 9:00 p.m.

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**Cc:** Carmela McHenry

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Ken

**From:** Karen Clark <kclark@westlandswater.org>  
**Date:** Fri, 7 Jan 2011 09:49:32 -0800  
**To:** "joe.findaro@akerman.com" <joe.findaro@akerman.com>, Tony Coelho <tony@onewharf.com>, "David L. Bernhardt" <DBernhardt@BHFS.com>, Ken Khachigian <KKhachigian@bhfs.com>, "████@██████████" <████@███████████ Ed Manning <emanning@ka-pow.com>, Carolyn Jensen <cjensen@ka-pow.com>, Jason Peltier <jpeltier@westlandswater.org>, "sramos@westlandswater.org" <sramos@westlandswater.org>, Sarah Woolf <██████████@███████████ Don Peracchi <██████@███████████ Tom Houston <THouston@bhfs.com>, Bill Kahrl <bkahrl@westlandswater.org>, Craig Manson <cmanson@westlandswater.org>  
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**From:** Joni F. Johnson  
**Sent:** Friday, January 7, 2011 11:21 AM  
**To:** Thomas W. Birmingham  
**Subject:** FW: PR/Legislation Strategy Session Reminder

Karen:

I am confirming that Ken Khachigian will be attending. Thank you again for confirming.

**Joni F. Johnson**  
**Executive Assistant to Kenneth L. Khachigian**  
**Brownstein Hyatt Farber Schreck, LLP**  
300 South El Camino Real, Suite 203  
San Clemente, CA 92672

[JFJohnson@bhfs.com](mailto:JFJohnson@bhfs.com)

949.498.3879 Office (Direct)

949.498.6197 Facsimile

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----- Forwarded Message

**From:** Ken Khachigian <KKhachigian@bhfs.com>  
**Date:** Fri, 07 Jan 2011 10:06:47 -0800  
**To:** "Joni F. Johnson" <JFJohnson@bhfs.com>  
**Conversation:** PR/Legislation Strategy Session Reminder  
**Subject:** FW: PR/Legislation Strategy Session Reminder

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**From:** Karen Clark  
**Sent:** Friday, January 7, 2011 11:42 AM  
**To:** Joni F. Johnson  
**Subject:** RE: PR/Legislation Strategy Session Reminder

Thanks, Joni!

~Karen

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<[REDACTED]@[REDACTED] [REDACTED] Ed Manning <emanning@ka-pow.com>, Carolyn Jensen <cjensen@ka-pow.com>, Jason Peltier <jpeltier@westlandswater.org>, "sramos@westlandswater.org" <sramos@westlandswater.org>, Sarah Woolf <[REDACTED]@[REDACTED] [REDACTED] Don Peracchi <[REDACTED]@[REDACTED] [REDACTED] Tom Houston <THouston@bhfs.com>, Bill Kahrl <bkahrl@westlandswater.org>, Craig Manson <cmanson@westlandswater.org>  
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*kclark@westlandswater.org* <<mailto:kclark@westlandswater.org>>

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**From:** Tony Coelho  
**Sent:** Friday, January 7, 2011 11:54 AM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Strategy Session Reminder

Thanks!

Tony

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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
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**To:** joe.findaro@akerman.com; Tony Coelho; David L. Bernhardt; Ken Khachigian; [REDACTED]@[REDACTED], [REDACTED] Ed Manning; Carolyn Jensen; Jason Peltier; sramos@westlandswater.org; Sarah Woolf; Don Peracchi; Tom Houston; Bill Kahrl; Craig Manson  
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**From:** Bernhardt, David L.  
**Sent:** Thursday, January 13, 2011 3:25 PM  
**To:** jpeltier@westlandswater.org  
**Subject:** Thank You

Jason:

Thank you for taking time away from your family to haul me around the delta. I appreciated the chance to see the landscape and enjoyed the company.

Best,  
David

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Bernhardt, David L.  
**Sent:** Thursday, January 13, 2011 3:32 PM  
**To:** tbirmingham@westlandswater.org  
**Subject:** Friday's Call

Tom:

Thank you for inviting our firm to participate in the meeting on Monday, and for taking the time to have lunch on Tuesday. As we discussed, I would be happy to participate in the Friday calls going forward. However, to do so, I will need the call in number.

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**From:** Jason Peltier  
**Sent:** Thursday, January 13, 2011 3:42 PM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Thank You

You bet! Next trip out, lets reserve some time for further investigation.

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**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Thursday, January 13, 2011 2:25 PM  
**To:** jpeltier@westlandswater.org  
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**From:** Bernhardt, David L.  
**Sent:** Thursday, January 13, 2011 3:44 PM  
**To:** Jason Peltier  
**Subject:** RE: Thank You

Absolutely!

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**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Thursday, January 13, 2011 5:42 PM  
**To:** Bernhardt, David L.  
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**From:** Tom Birmingham  
**Sent:** Thursday, January 27, 2011 6:51 PM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Friday's Call

David,

I apologize for the delay in responding to you email. I tried to telephone you last Friday, but you were on another telephone conference. In any event, our regular calls are held on Friday, at 7:30 a.m. PST. The number is (800) [REDACTED] [REDACTED] pass code [REDACTED] If you can join us tomorrow, please do.

Tom

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fax 202.296.7009

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**From:** Bernhardt, David L.  
**Sent:** Thursday, January 27, 2011 6:53 PM  
**To:** Tom Birmingham  
**Subject:** Re: Friday's Call

Thanks Tom. I will be on the call.

On Jan 27, 2011, at 8:50 PM, "Tom Birmingham" <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)> wrote:

David,

I apologize for the delay in responding to you email. I tried to telephone you last Friday, but you were on another telephone conference. In any event, our regular calls are held on Friday, at 7:30 a.m. PST. The number is (800) [REDACTED] - [REDACTED] pass code [REDACTED] If you can join us tomorrow, please do.

Tom

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Thursday, January 13, 2011 2:32 PM  
**To:** [tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)  
**Subject:** Friday's Call

Tom:

Thank you for inviting our firm to participate in the meeting on Monday, and for taking the time to have lunch on Tuesday. As we discussed, I would be happy to participate in the Friday calls going forward. However, to do so, I will need the call in number.

Thanks,  
David

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Jason Peltier

**Sent:** Wednesday, February 2, 2011 9:41 AM

**To:** joe.findaro@akerman.com; 'Brad Hiltcher'; cingram@tnc.org

**CC:** David Reynolds; 'Beth Gerbutavicius'; 'Laura King Moon'; RPatterson@mwdh2o.com; 'Bernhardt, David L.'

**Subject:** list for BDCP meetings in DC 2/14-2/16

Dr. Jerry Meral, Deputy Secretary, California Natural Resources Agency

Laura King-Moon, State Water Contractors

Campbell Ingram, The Nature Conservancy

Roger Patterson, Metropolitan Water District of Southern California

Jason Peltier, Westlands Water District

Lead Coordinators: Beth and Laura [in constant radio contact with Joe and Brad.]

Follow-up coordination call next Tuesday to be organized by Laura. Topics: schedule developments and messaging.

**From:** Beth Gerbutavicius  
**Sent:** Wednesday, February 2, 2011 4:38 PM  
**To:** Jason Peltier; joe.findaro@akerman.com; Brad Hiltcher; cingram@tnc.org  
**CC:** David Reynolds; Laura King Moon; RPatterson@mwdh2o.com; Bernhardt, David L.  
**Subject:** RE: list for BDCP meetings in DC 2/14-2/16

FYI -

My contact below:

Beth Gerbutavicius, SSMI  
California Natural Resources Agency  
1416 Ninth Street, Suite #1311  
Sacramento, CA 95814  
(916) 653-5227  
[b.gerbs@resources.ca.gov](mailto:b.gerbs@resources.ca.gov)

And Mr. Meral contact info:

Dr. Gerald H. Meral  
Deputy Secretary for BDCP  
Office: (916) 653-5672  
Cell: (415) [REDACTED]  
[Jerry.meral@resources.ca.gov](mailto:Jerry.meral@resources.ca.gov)

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Wednesday, February 02, 2011 8:41 AM  
**To:** joe.findaro@akerman.com; 'Brad Hiltcher'; cingram@tnc.org  
**Cc:** David Reynolds; Beth Gerbutavicius; 'Laura King Moon'; RPatterson@mwdh2o.com; 'Bernhardt, David L.'  
**Subject:** list for BDCP meetings in DC 2/14-2/16

Dr. Jerry Meral, Deputy Secretary, California Natural Resources Agency  
Laura King-Moon, State Water Contractors  
Campbell Ingram, The Nature Conservancy  
Roger Patterson, Metropolitan Water District of Southern California  
Jason Peltier, Westlands Water District

Lead Coordinators: Beth and Laura [in constant radio contact with Joe and Brad.]

Follow-up coordination call next Tuesday to be organized by Laura. Topics: schedule developments and messaging.

**From:** Reynolds, David  
**Sent:** Friday, February 4, 2011 2:24 PM  
**To:** Jason Peltier; joe.findaro@akerman.com; Brad Hiltcher; cingram@tnc.org  
**CC:** Beth Gerbutavicius; Laura King Moon; RPatterson@mwdh2o.com; Bernhardt, David L.  
**Subject:** RE: list for BDCP meetings in DC 2/14-2/16

Also Abby Schneider and Kristin Goree in the ACWA office. [ashneider@sso.org](mailto:ashneider@sso.org) [kgoree@sso.org](mailto:kgoree@sso.org) Thanks. Sorry to be missing all the fun. DR

David L. Reynolds  
Director of Federal Relations  
Association of California Water Agencies  
400 North Capitol St., NW, Suite 357, Wash. DC 20001  
Tel. 202-434-4760

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Wednesday, February 02, 2011 11:41 AM  
**To:** joe.findaro@akerman.com; 'Brad Hiltcher'; cingram@tnc.org  
**Cc:** Reynolds, David; 'Beth Gerbutavicius'; 'Laura King Moon'; RPatterson@mwdh2o.com; 'Bernhardt, David L.'  
**Subject:** list for BDCP meetings in DC 2/14-2/16

Dr. Jerry Meral, Deputy Secretary, California Natural Resources Agency  
Laura King-Moon, State Water Contractors  
Campbell Ingram, The Nature Conservancy  
Roger Patterson, Metropolitan Water District of Southern California  
Jason Peltier, Westlands Water District

Lead Coordinators: Beth and Laura [in constant radio contact with Joe and Brad.]

Follow-up coordination call next Tuesday to be organized by Laura. Topics: schedule developments and messaging.

**From:** Jason Peltier  
**Sent:** Wednesday, February 9, 2011 3:23 PM  
**To:** Larrabee, Jason  
**CC:** 'Weaver, Kiel'; joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** developments  
**Attachments:** EPA draft deltaMASTERANPR11111.pdf

Two things look to happen before our group arrives in DC next week. Not sure how they will spill over but....

Region IX of EPA is releasing a report/regulatory proposal this Thursday [bootleg draft attached]. May be fodder related to article below....

And the Delta Stewardship Council is set to release the first draft of their "Delta Plan" on Monday. expect a real shit-pile of over-reach and same tired issues [flow flow flow etc.]

**U.S. Sen. Grassley: Keeps pressure on EPA to focus on job creation instead of over burdensome regulations**  
2/9/2011

For Immediate Release Tuesday, February 8, 2011

WASHINGTON – Senator Chuck Grassley is continuing to highlight the senseless regulations placed on family farmers and small businesses by the Environmental Protection Agency. Today, Grassley sent a letter to Chairman of the House Committee on Oversight and Government Reform, Darrell Issa, to bring to his attention the EPA's attempt to regulate dust.

The EPA has released several policy assessments that would lower the particulate matter standards for dust to levels which would be extremely burdensome for farmers and livestock producers. Whether its livestock kicking up dust, soybeans being combined on a dry day in the fall, or driving a car down the gravel road, dust happens. Producers could potentially be fined for not meeting the particulate matter standards while still practicing good management practices on their soils.

"The EPA's attempt to regulate dust is just another example of how out of touch the agency is with the grassroots," Grassley said. "The continued disregard for agriculture hurts the economic viability of rural America and hinders job creation."

Grassley said he wanted Issa, who is bringing to light hundreds of federal regulations that hurt job creation, to be aware of yet another nonsensical regulation that would slow economic development and cause significant costs on the nation's family farmers.

Here is a copy of the text of Grassley's letter to Issa.

February 8, 2011

The Honorable Darrell Issa Chairman House Committee on Oversight and Government Reform 2157 Rayburn House Office Building  
Washington, DC 20515

Dear Chairman Issa,

As you know, on January 18, 2011, President Obama signed an Executive Order which required federal agencies to review all regulations, taking into account the costs and excessive burdens they might put on businesses. A recent Wall Street Journal editorial reported that the U.S. Environmental Protection Agency (EPA), less than a week after the President signed this Order, stated "that it was 'confident' it wouldn't need to alter a single current or pending rule." This statement appears pre-emptive of the President's order.

I commend you for scheduling a full committee hearing on Thursday, February 10, 2011 on "Regulatory Impediments to Job Creation." It is my belief that EPA has long over stretched its bounds, resulting in detrimental impacts to farmers and ranchers across the country.

Last July, I and twenty of my Senate colleagues on both sides of the aisle wrote to Administrator Lisa Jackson with our continued concerns regarding EPA's actions in its review of the National Ambient Air Quality Standards (NAAQS). If approved, the Second Draft Policy Assessment (PA) for Particulate Matter (PM) released on July 8, 2010 would establish the most stringent and unparalleled regulation of dust in our nation's history revising current levels of 150ug/m3 down to 65-85 ug/m3. Our letter encouraged EPA to consider maintaining the primary and secondary standards, or in the alternative, consider different PM indicators. We also asked that the Clean Air Scientific Advisory Committee focus attention on EPA's choice to not adopt a PM10-2.5 standard. I have enclosed a copy of that letter for your information.

I am concerned that EPA has pre-judged its review of existing and pending rules. The President has now required that cost considerations on businesses, including farmers and ranchers, be taken into account. I respectfully ask that when your committee meets on February 10, 2011, that the PA for Particulate Matter be discussed. This would be an opportune time to further highlight and

expose this potential rule which could wreck havoc, particularly in the Western part of the United States.

As I have continually advocated over the years, lowering these PM standards could have devastating and burdensome effects on farmers and ranchers across the country. Excessive dust control measures could be imposed on agricultural operations which would only slow economic development and impose significant costs on our nation's family farmers and ranchers.

As I've often said, only God can determine when the wind blows. Exposing EPA's potential rulemaking in this area of dust control is critically important to the future profitability of our nation's producers. Thank you for scheduling this important hearing and for consideration of my request.

Sincerely,

Charles E. Grassley United States Senator

# Unabridged Advanced Notice of Proposed Rulemaking for Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

# 2011



## EPA

United States  
Environmental Protection  
Agency

1/20/2011



SUMMARY: The U.S. Environmental Protection Agency (EPA) is publishing this unabridged advance notice of proposed rulemaking (ANPR) today to seek comments from interested parties on possible EPA actions intended to address water quality conditions affecting aquatic resources in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Estuary) in California. This unabridged ANPR is provided on EPA Region 9's website (<http://www.epa.gov/region9/water/watershed/sfbay-delta/index.html>) and in the electronic docket available at <http://www.regulations.gov>, docket number EPA-R09-OW-2010-0976. EPA is asking the public to consider broadly whether EPA should be taking new or different actions under its programs to address recent significant declines in multiple aquatic species in the Bay Delta Estuary. EPA is not limiting its request to actions that would require rulemaking. There may be a range of changes in EPA's activities in the Bay Delta Estuary that would be constructive, including enforcement, research, revisions to water quality standards, etc. EPA will consider all comments before deciding what changes, if any, should be pursued. After reviewing the comments and completing its evaluation, EPA will provide the results of its review and any proposed next steps to the public. This ANPR identifies specific issues on which EPA solicits comment, including potential site-specific water quality standards and site-specific changes to pesticide regulation. In addition to the specific issues on which EPA solicits comments, EPA is interested in comments on any other aspects of EPA's programs affecting Bay Delta Estuary aquatic resources.

---

Written comments must be submitted 60 days from publication, received by EPA by midnight March XX, 2011

Written comments, identified by docket number EPA-R09-OW-2010-0976, may be submitted electronically at the *Federal Rulemaking Portal* (<http://www.regulations.gov>). Hard copy comments should be addressed to Erin Foresman, U.S. Environmental Protection Agency, 75 Hawthorne Street, WTR-3, San Francisco, California 94105.

*Instructions:* All comments will be included in the public docket without change and may be made available online at <http://www.regulations.gov>, including any personal information provided, unless the comment includes Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Information that you consider CBI or otherwise protected should be clearly identified as such and should not be submitted through <http://www.regulations.gov> or e-mail. <http://www.regulations.gov> is an "anonymous access" system, and EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send email directly to EPA, your e-mail address will be automatically captured and included as part of the public comment. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment.

*Docket:* The index to the docket for this action is available electronically at <http://www.regulations.gov> and in hard copy at EPA Region IX, 75 Hawthorne Street, San Francisco, California. While all documents in the docket are listed in the index, some information may be publicly available only at the hard copy location (e.g., copyrighted material), and some may not be publicly available in either location (e.g., confidential business information). To inspect the hard copy materials, please schedule an appointment during normal business hours with Erin Foresman, [foresman.erin@epa.gov](mailto:foresman.erin@epa.gov); (916)557-5253.

FOR FURTHER INFORMATION CONTACT: Erin Foresman at U.S. Environmental Protection Agency, Region 9, Water Division, 75 Hawthorne Street, San Francisco, California 94105; [foresman.erin@epa.gov](mailto:foresman.erin@epa.gov); (916)557-5253.

### **Potentially Affected Entities**

This ANPR has no regulatory impact or effect. The ANPR contains descriptions of certain EPA programs relevant to the Bay Delta Estuary and poses questions about how these programs could better address the protection and improvement of water quality for the benefit of aquatic resources in the Bay Delta Estuary. As discussed in more detail below, this ANPR marks the beginning of a process on possible changes to EPA programs in the Bay Delta Estuary. In the event that EPA decides to pursue regulatory changes as a result of this ANPR, those regulatory changes will be made pursuant to appropriate formal notice and comment rulemaking procedures. If changes to any regulations, rules, guidance or statutes are proposed and ultimately made final, to the extent such changes would require and/or authorize changes to state and tribal water quality standards or other regulations, states and authorized tribes would be affected. If changes to state and tribal regulations result from any final rule that EPA may promulgate in the future, entities subject to compliance with state or tribal regulations would also potentially be affected. For example, states and tribes authorized to implement the National Pollutant Discharge Elimination System (NPDES) Permit Program would need to ensure that permits they issue include any limitations on discharges necessary to comply with any water quality standards established as a result of any subsequent final rulemaking. Therefore, entities discharging pollutants to waters of the United States under NPDES could be affected by subsequent proposed and final rulemaking.

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## **I. PURPOSE OF THIS ANPR**

The Bay Delta Estuary is a complex web of waterways, islands, and levees at the junction of the San Francisco Bay and the Sacramento and San Joaquin Rivers.<sup>1</sup> The Bay Delta Estuary is the hub of California's water distribution system, supplying some or all of the drinking water to 23 million people and irrigation water to 4 million acres of farmland.

As discussed in more detail below, water quality and aquatic resources in the Bay Delta Estuary are under serious stress. All of the waters of the Estuary and most of its tributaries are listed as impaired for one or more parameters under the federal Clean Water Act.<sup>2</sup> Populations of many formerly abundant open-water (i.e., pelagic) fish species, including delta smelt, longfin smelt, and threadfin shad, have collapsed in recent decades. Anadromous<sup>3</sup> fishes, including the winter run chinook salmon, have suffered a similar decline. The decline of these aquatic resources has generated debate over water resource management in the Bay Delta Estuary. Delta interests, including state and federal agencies, environmental groups, urban and agricultural water users, commercial and recreational fishermen, and others have spent many years grappling with Bay Delta Estuary resource issues.

Controversy surrounding Bay Delta Estuary water resource management surged during the 2009 water year<sup>4</sup> as water users and resource managers struggled with the effects of three years of drought. Water export limitations caused by the drought and by restrictions imposed under the federal Endangered Species Act (ESA)<sup>5</sup> to assist struggling endangered species significantly reduced the availability of water for agricultural and urban uses.<sup>6</sup> At the same time, the salmon fishery was closed on most of the West Coast for a second consecutive year as a result of dramatic declines in that fishery. Both the agricultural and fishery sectors suffered job losses as a result of the drought and the water export restrictions.

The federal government responded to this ongoing water management crisis with a broad set of actions.<sup>7</sup> One of those actions was the creation of the Federal Bay Delta Leadership Committee, a Cabinet-level, multi-agency committee charged with coordinating federal responses to Bay Delta Estuary conflicts.<sup>8</sup> The Federal Bay Delta Leadership Committee released its Interim Federal Action Plan for the California Bay-Delta (Federal Action Plan) on December 22, 2009, outlining the federal government's plan to address the Bay Delta Estuary crisis and to work with the State of California to build a sustainable water future.<sup>9</sup> The Federal Action Plan includes actions by EPA to "assess the effectiveness of the current regulatory mechanisms designed to protect water quality in the Delta and its tributaries, including standards for toxics, nutrients, and estuarine habitat protection." EPA will also evaluate voluntary mechanisms that may be used to restore the Delta. This ANPR is the beginning of these assessments.

New scientific information about the Bay Delta Estuary and its aquatic resources has substantially increased in the past few years. This information has been developed and/or reviewed in reports<sup>10</sup> synthesizing information on aquatic resources and water quality by the following entities: the State/Federal Interagency Ecological Program Pelagic Organism Decline (POD) science team,<sup>11</sup> the State's Delta Vision Blue Ribbon Task Force, the Public Policy

Institute of California (PPIC), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS) as part of their biological opinions and associated independent science reviews, the California State Water Resources Control Board (State Board) and Central Valley Regional Water Quality Control Board (Central Valley RWQCB).<sup>12</sup> Most of these studies and reports involve resources protected under the Clean Water Act and other EPA programs.

EPA is using this ANPR to solicit and synthesize existing scientific information regarding the biological, chemical, and physical integrity of the Bay Delta Estuary's aquatic resources. EPA will comprehensively review this information as it evaluates its statutory and regulatory options in the Bay Delta Estuary and will develop an appropriate EPA response. Specifically, the purposes of this ANPR are:

- (1) To review the current status of the EPA and Water Boards'<sup>13</sup> responses to adverse water quality conditions that have been identified as potential contributors to the Bay Delta Estuary's aquatic resources decline;
- (2) To determine how best to implement existing programs under the Clean Water Act and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)<sup>14</sup> to improve Bay Delta Estuary water quality for aquatic resources;
- (3) To determine impediments, either programmatic or statutory, to improving Bay Delta Estuary water quality;
- (4) To identify any additional scientific information relevant to the question of water quality related to aquatic resources in the Bay Delta Estuary; and
- (5) To solicit input on whether EPA should be taking new or different actions under its programs to address aquatic resource problems in the Bay Delta Estuary.

Specific topics on which EPA is requesting comments appear in the sections below.

There are several major efforts underway to address Bay Delta Estuary resources, including the regulatory programs of the Water Boards under state and federal water quality statutes. In July 2008, the Water Boards adopted a Strategic Workplan to coordinate and guide their Bay Delta Estuary activities.<sup>15</sup> Over the next several years, these state activities will include, among others, multiple point source permit renewals, new pollutant and flow standards for the southern Delta and lower San Joaquin River, and Total Maximum Daily Loads (TMDLs) for pesticides in the Central Valley. EPA continues to support many of the elements in the State's Workplan through technical and financial assistance.

Any EPA actions taken as a result of this ANPR will complement the Water Boards' actions, as EPA's priority is to support and augment these efforts. Should the Water Boards' activities falter for any reason, such as budgetary and staffing limitations, EPA must be prepared to take necessary action so that the goals of the Clean Water Act and other federal statutes can be attained. Finally, regardless of whether EPA pursues any new actions as a result of this ANPR, EPA believes the information gathered through the ANPR process may provide a factual basis

for EPA's ongoing activities under the Clean Water Act, the National Environmental Policy Act,<sup>16</sup> and other federal statutes in the Bay Delta Estuary.

Nothing in this ANPR constrains the discretion of the President or his successors to make whatever budgetary or legislative proposals he or his successors deem appropriate or desirable. The expenditure of any money or the performance of any obligation of the United States emanating from this ANPR shall be contingent upon appropriation or allotment of funds in accordance with 31 U.S.C. § 1341 (Anti-Deficiency Act)<sup>17</sup>.

### ***Related Efforts in the Bay Delta Estuary***

There are major federal and state water resource planning efforts underway in the Bay Delta Estuary. Stakeholders and relevant government agencies are engaged in developing the Bay Delta Conservation Plan (BDCP) under the federal Endangered Species Act and the California Natural Communities Conservation Plan Act (NCCP).<sup>18</sup> The BDCP focuses on the recovery of ESA-listed species and their habitat in the Bay Delta Estuary, and is expected to include major proposals for changing how water is diverted and conveyed through the Bay Delta Estuary to the state and federal water export pumping facilities in the south Delta.<sup>19</sup> In addition, recent state legislation has established the Delta Stewardship Council (DSC), an independent state agency charged with developing a comprehensive Delta Plan by January 2012.<sup>20</sup> EPA will strive to ensure that its efforts complement these related efforts.

The National Academy of Sciences (NAS) has initiated a review of the science supporting Endangered Species Act protections in the Bay Delta Estuary. Much of that scientific information is also relevant to Clean Water Act programs. Accordingly, EPA is coordinating with the NAS to assure that scientific evaluations serve the multiple regulatory programs in the Bay Delta Estuary.

Many activities discussed in this notice have been or are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those processes that is relevant to the issues raised in this notice, commenters may either reference earlier submissions (if submitted to EPA), attach earlier submissions (if submitted to a different agency), or, if appropriate, provide a link to the material online.

### ***Scope of this ANPR***

This ANPR is focused on the most significant water quality factors adversely affecting aquatic species designated uses in the Bay Delta Estuary. Aquatic species, specifically the salmonids and pelagic species suffering significant population collapse during the last decade, brought the Bay Delta Estuary's water resource management conflicts into sharp focus in recent years. EPA recognizes that the Bay Delta Estuary supports over 750 species of fish, mammals, birds, reptiles, amphibians, invertebrates, and plants, and that forty or more of these species are listed under state and/or federal endangered species laws.<sup>21</sup> This ANPR is focused on aquatic

species designated uses for waterbodies in the Bay Delta Estuary, but welcomes comment on how other species are being affected by water management decisions.

This ANPR does not comprehensively discuss water quality issues related to other designated uses, including drinking water, recreation, fish consumption, agriculture, etc. For example, water contact sports have been restricted in certain Bay Delta Estuary waters due to toxic blue-green algae blooms. EPA acknowledges the ongoing need to evaluate and address these other issues.

## **II. INTRODUCTION TO EPA ACTIVITIES IN THE BAY DELTA ESTUARY**

### **A. Factual Background**

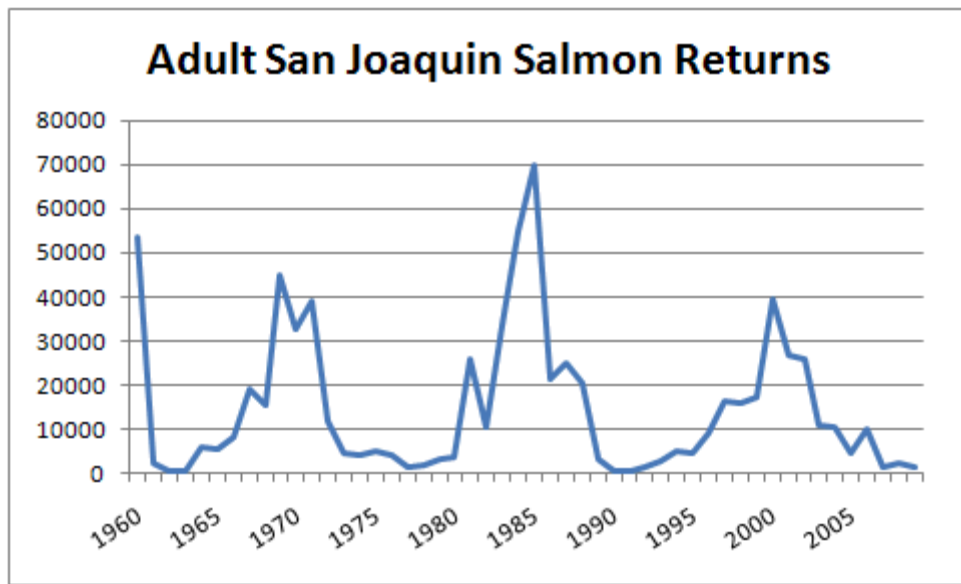
The Bay Delta Estuary is the intersection of two large river systems – the Sacramento and San Joaquin River basins – and a series of bays, marshes, and channels leading out to the San Francisco Bay and, ultimately, through the Golden Gate to the Pacific Ocean. Critical to California's social, political, economic and ecological well-being, the Bay Delta Estuary has long been the focus of competing interests (such as in-Delta agriculture, water exports, and flood control) that have significantly altered its waterways, flows, and adjacent lands. The Bay Delta Estuary is the hub of California's water distribution system, supplying drinking water to 23 million people and irrigation water to 4 million acres of farmland. Intensive urban and agricultural land uses in and upstream of the Bay Delta Estuary add an increasing and diverse array of water pollutants. As a result of these demands and stresses, the Bay Delta Estuary ecosystem, which is crucial habitat for many highly valued fish and wildlife species, has suffered greatly. Habitats are declining and fish populations have plummeted and several species are listed as threatened or endangered under the ESA. Water quality in the Delta and its tributaries is impaired, contributing to the ecological and water supply crisis in the Bay Delta Estuary. The system is no longer a reliable source of high quality water for urban and agricultural use, especially in the quantities demanded in recent years. In addition, the Bay Delta Estuary's outdated earthen levees face an unacceptably high risk of breaching.<sup>22</sup>

### **1. Current State of Estuarine Resources**

The decline of native fisheries in the Bay Delta Estuary over the past several decades is dramatic and well-documented.<sup>23</sup> The graphs below summarize that decline since the 1970's, for migratory and resident fish.<sup>24</sup>

The fall run of chinook salmon (*Onchorhynchus tshawytscha*) is the main run of salmon supporting the commercial and sport fisheries.<sup>25</sup> Winter run and spring run chinook salmon are listed as endangered and threatened, respectively, under the Endangered Species Act. Central Valley populations of green sturgeon (*Acipenser transmontanus*) and steelhead trout (*Onchorhynchus mykiss*) are also listed as threatened.

Figure A. Adult San Joaquin Salmon Returns 1960-2009



Commercial and sport fishing of salmon was cancelled by the Pacific Fishery Management Council for most of the western coast of North America in 2008 and 2009. A very limited season was authorized for 2010.<sup>26</sup>

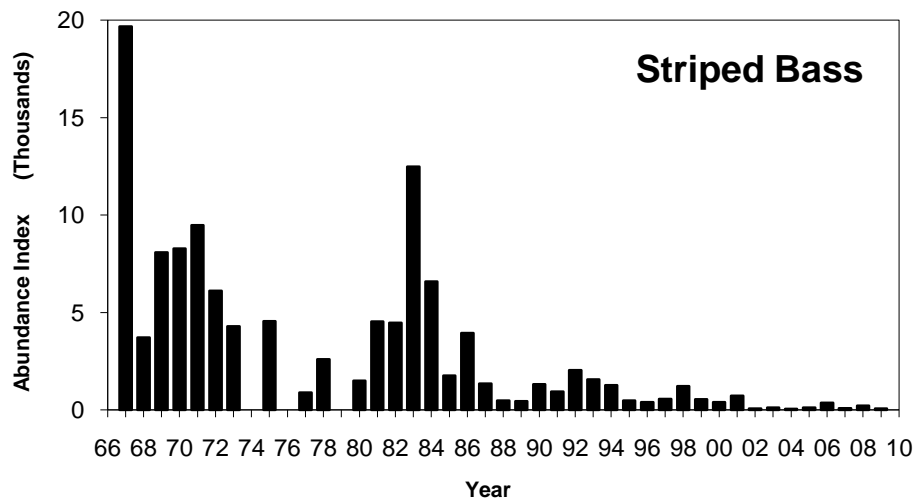
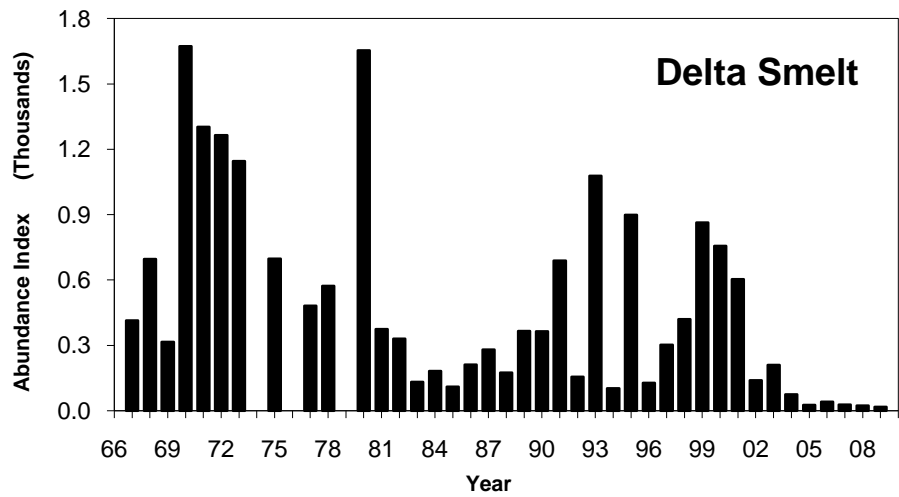
The decline between 2007 and 2010 in the abundance of salmon appears to be due to poor ocean conditions leading to very poor ocean survival of one and two year old fish.<sup>27</sup> However, the sensitivity of the species to these ocean conditions is heightened by the long-term decline in freshwater and estuarine conditions, including pollution, diversion, and loss of shallow habitats.<sup>28</sup> The loss of genetic diversity due to increased reliance on hatcheries has also contributed to reduced resilience of the fall run chinook salmon population. Impacts of the 2007-2009 drought on the adult salmonid population are not yet measurable due to the time lag between spawning and maturation.

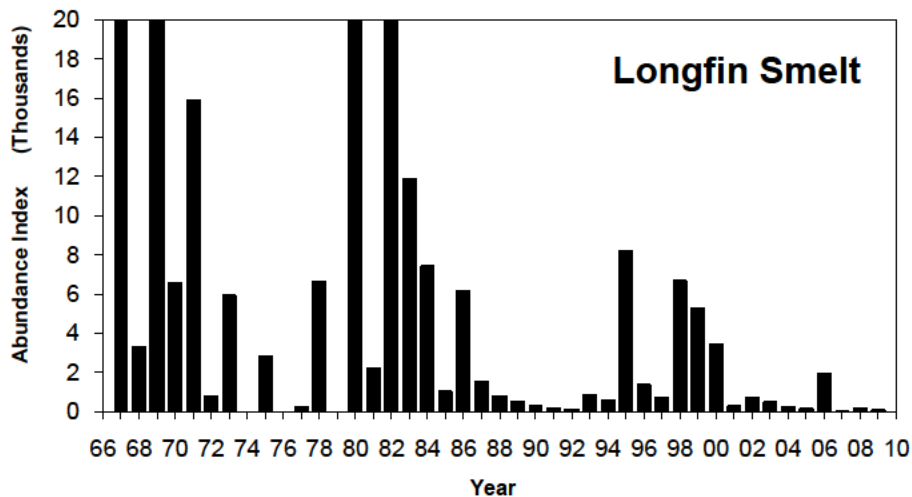
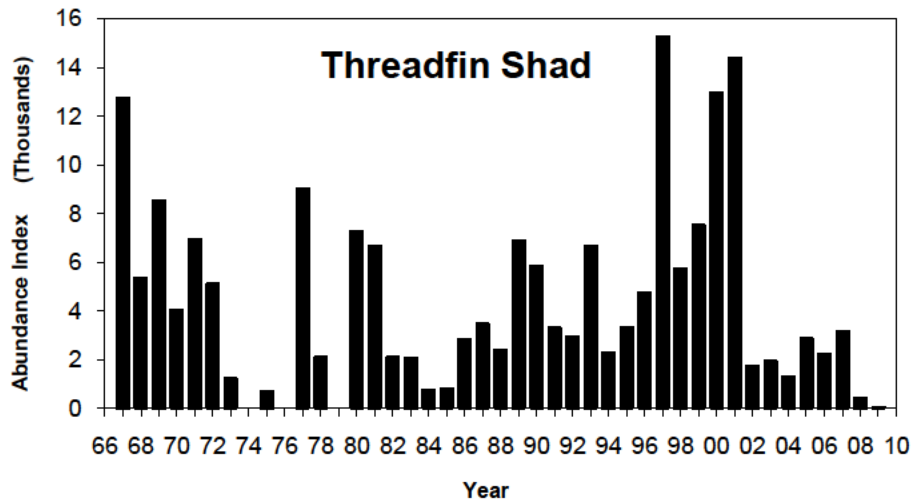
Many of the native and valued species of the upper Bay Delta Estuary are pelagic. Pelagic species live in open water, and are not usually associated with channel edges or physical structure. These species include two species (threadfin shad and striped bass) that were, until recently, the most abundant in the Bay Delta Estuary as well as the ESA listed delta and longfin smelt.

After 2001, many of the pelagic species suffered nearly simultaneous, sharp population declines despite relatively favorable hydrological conditions. The declines occurred without the weather patterns usually associated with year-to-year variations in abundance and with no obvious other cause. Even in wetter periods, which historically have been associated with higher numbers, several of these species had record low abundances.<sup>29</sup> The declining trends continued during the drought conditions of 2007-2009. Recent research indicates these declines represent an abrupt, significant drop in population abundance, rather than simply an extreme outcome of normal abundance cycles.<sup>30</sup>



Figure B. Trends in four pelagic fishes from 1967 to 2009 based on the Fall Midwater Trawl<sup>31</sup>





This sudden and unexpected decline (called the “Pelagic Organism Decline” or “POD”) has been intensively studied. The Interagency Ecological Program (IEP)<sup>32</sup> began a number of investigations into likely causes of the decline including stock-recruitment, habitat degradation, increased predation or mortality at export facilities and changes in food web connections.<sup>33</sup> All of these factors changed in nature or intensity around the time of the decline and have been implicated in the resilience and abundance of these fish populations.

The government agency, academic, and stakeholder biologists studying the collapse of the pelagic and salmonid fisheries have identified several potential causes of the decline. These include:

(1) *Water project operations.* Sharp increases occurred in the number of fish trapped by and collected at the State Water Project (SWP) and Central Valley Project (CVP) export facilities at the same time that catches in all other collection programs declined and water exports out of the Bay Delta Estuary consistently increased.<sup>34</sup> After 2001, approximately 6 million acre-feet (MAF) of new water storage space became available south of the Delta. The availability of this new storage space enabled approximately 1 MAF of additional annual exports from 2001 through 2006. Total annual exports went from a maximum of about 5 MAF in the late 1990s to about 6 MAF after 2000. Existing regulatory standards are oriented toward export restrictions in the spring to protect critical migration periods during high flow periods, so these additional exports were generally taken during the fall and early winter months. These greater exports resulted in both (1) greater levels of entrainment<sup>35</sup> and (2) reductions in Delta outflow and a concomitant decline in the volume of estuarine habitat (measured by the areal extent of low salinity zones) for several species (delta smelt, striped bass, and threadfin shad) in the fall of all years.<sup>36</sup>

(2) *Invasive Species.* Invasive overbite clams have established year-round populations in the western Delta and are implicated in the reduction in abundance of both diatoms and zooplankton that are the base of the food web for pelagic fish.<sup>37</sup> At the same time, invasive jellyfish have become a large part of the pelagic environment and are known to compete with small fish for food and to prey directly on young fish. Further, the composition of the base of the food web has shifted to smaller and less nutritious invasive species.

(3) *Ocean conditions.* Ocean conditions (including limited ocean food sources and adverse temperature conditions) during the drought played a large part in the recent declines of anadromous fish, and upstream and migratory conditions made the populations less resilient to such oceanic stressors.<sup>38</sup> Ocean conditions alone appear to have little effect on the declining resident Delta fishes.<sup>39</sup>

(4) *Contaminants.* The contribution of water pollution, or contaminants, to the instability of the Bay Delta Estuary aquatic ecosystem and the specific role of contaminants in the decline of pelagic fishes has been examined in the past decade. Pyrethroid insecticide<sup>40</sup> use became much more common after the year 2000 and may be associated with tissue abnormalities found in delta smelt and striped bass.<sup>41</sup> Some pyrethroid insecticides are toxic to aquatic invertebrates, food for pelagic fishes, at very low levels.<sup>42</sup> In-Delta discharges from Delta islands are a source of contaminants to the Bay Delta Estuary. The composition of discharge from these Delta islands is largely uncharacterized; it consists primarily of irrigation return flow, levee seepage, and precipitation runoff.

Other contaminants are also present in the Bay Delta Estuary,<sup>43</sup> sometimes at toxic levels.<sup>44</sup> Ammonia/um discharges from the Sacramento and Stockton wastewater treatment plants led to loadings that could be expected to affect algal community composition and growth.<sup>45</sup> Although the Stockton plant converted to more effective levels of treatment in 2007, the Sacramento plant has continued to generate ammonia/um at levels that have prompted intensive examination of downstream impacts, particularly reductions in the growth of diatoms (which are the base of the food web for most pelagic fish). Chemical treatment of estuarine waters to combat the spread of submerged aquatic weeds began in 2002.<sup>46</sup> Summertime blooms

of the toxic blue-green algae *Microcystis aeruginosa* became more widespread throughout the decade, extending downstream to the habitat usually occupied by delta smelt and young striped bass in 2007. Blue-green algal growth and blooms have been linked to ammonia loadings and herbicide treatments such as those used to treat aquatic weeds.<sup>47</sup>

Current research findings do not support the idea that a “single stressor” is responsible for the ecological changes in the Bay Delta Estuary.<sup>48</sup> Most research supports the idea of multiple stressors, interacting in concert, as the cause of Bay Delta Estuary aquatic resources declines. Most efforts at synthesizing Bay Delta Estuary ecosystem research have converged on a vision of the Bay Delta Estuary as an ecosystem that is shifting its species composition in response to a suite of changes in flow, nutrients, contaminants, temperature and turbidity.<sup>49</sup>

## **2. Defining a Functional Estuary in a Changing Environment**

Research efforts that began as a response to the POD have identified several significant and fundamental changes in the physical nature of the Bay Delta Estuary: water temperatures and water clarity have been increasing; nitrogen loading has been increasing while phosphorus loading has been decreasing, resulting in substantial changes in nutrient ratios; and water exports have been substantially increasing while outflows to the San Francisco Bay have been low and stable for much of the year. Simultaneously, the ecological community of the upper Bay Delta Estuary appears to have shifted from a food web based on diatoms, large copepods, and pelagic fish to one of cyanobacteria, jellyfish, clams, and emergent vegetation housing large populations of the predatory largemouth bass and their relatives. Species which prefer the shallow edges of riverbeds, such as non-native sunfish, bass, and minnows that live among invasive submerged vegetation, have become dominant. This change is associated with habitat shifts, as introduced vegetation coverage has increased each year.<sup>50</sup> The aquatic resources of the Bay Delta Estuary seem to be shifting from the former pelagic, estuarine community to an assemblage of invasive species more characteristic of a eutrophic stable system, including harmful algal blooms, jellyfish, clams, and freshwater fishes.<sup>51</sup>

Many, if not most, of these fundamental changes in Bay Delta Estuary ecology are the result of human activities over the past century or more: the reclamation of delta islands for human use; the dredging, deepening and channelization of waterways in the Bay Delta Estuary; the export of significant amounts of water out of the Bay Delta Estuary; the introduction of undesirable invasive species; and the introduction and increase of a wide range of contaminants into the Bay Delta Estuary’s waterways.<sup>52</sup> Equally significant additional changes affecting the Bay Delta Estuary will challenge resource managers in the future. The antiquated levee system - a system that has suffered at least 160 major levee failures over the past century<sup>53</sup> - will face new stresses from continued subsidence, seismic events, and from climate change induced rise in sea levels.<sup>54</sup> The pattern and nature of precipitation is also anticipated to change, as less snow and more rain present additional challenges for the flood control system in the Bay Delta Estuary and for water resource managers. Changes in precipitation and runoff patterns, combined with warmer air temperatures, will continue to raise water temperatures.<sup>55</sup>

Given these current and probable future changes in the Bay Delta Estuary, the task for California and federal regulatory agencies and water resource managers is to align regulatory

programs and public investments to enable the Bay Delta Estuary to achieve all of its desired uses.

## **B. EPA Programs in the Bay Delta Estuary**

Two federal statutes under EPA's jurisdiction are important to Bay Delta Estuary aquatic resource issues. The most relevant is the federal Clean Water Act, which establishes standards for protecting the nation's water resources and establishes implementation approaches for point source discharges and nonpoint sources of pollution.<sup>56</sup> Under the Clean Water Act, EPA is authorized to delegate many Clean Water Act programs to requesting qualified states and tribes. In California, most of the Clean Water Act programs have been formally delegated to the State, with EPA retaining an oversight role and, in some cases, a mandatory review and approval role.

In addition to the Clean Water Act, the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. Sections 136 et seq. (FIFRA) governs pesticide use nationally and prescribes restrictions on the use of pesticides to assure reasonable certainty of no harm to aquatic species in the Bay Delta Estuary, taking into account the economic, social, and environmental costs and benefits of the pesticide use. Under FIFRA, EPA has accorded primary enforcement responsibility for pesticide use violations (primacy) to California, with EPA providing funding and technical assistance.

### **1. Clean Water Act**

There are several regulatory components of the Clean Water Act that affect Bay Delta Estuary issues: water quality standards, point source discharge regulation under the National Pollution Discharge Elimination System (NPDES) program, the listing of impaired waters with responsive Total Maximum Daily Load (TMDL) calculations under Clean Water Act Section 303(d), nonpoint source management programs under Clean Water Act Section 319, and the wetlands regulatory program under Clean Water Act Section 404. In addition, under the Clean Water Act, EPA provides annual grants to California to carry out Clean Water Act programs, including the programs under Clean Water Act Sections 106 and 319. In 2010 alone, these grant programs provided more than \$22 million to programs in California. In addition, each year EPA provides California with two large capitalization grants, one under the Clean Water Act and another under the Safe Drinking Water Act (SDWA). These funds are added to California's revolving loan programs which provide low-interest financing for a range of water quality and environmental improvement projects. Since 2008, EPA has awarded California \$942 million through these two grant programs.

#### **a. Water Quality Standards**

Water quality standards (WQS) serve as the foundation for the water-quality based approach to pollution control and are a fundamental component of watershed management. Section 303(c) of the Clean Water Act establishes the basis for the current water quality standards program. That section:

1. Defines water quality standards;<sup>57</sup>

2. Identifies acceptable designated uses: public water supply, propagation of fish and wildlife, recreational purposes, agricultural and industrial water supplies and navigation;
3. Requires that state and tribal standards protect public health or welfare, enhance the quality of water and serve the purposes of the Act;<sup>58</sup>
4. Requires that states and tribes review their standards every three years; and
5. Establishes the process for EPA review and approval of state and tribal standards, including, where necessary, the promulgation of a superseding federal rule in cases where a state's or tribe's standards are not consistent with applicable requirements of the Clean Water Act or in situations where the Administrator determines that federal standards are necessary to meet the requirements of the Act.

Generally, states establish water quality standards on a watershed or broader basis, but they can also address unique aquatic circumstances through the use of site-specific standards. These site-specific standards can apply to a single waterbody or a particular segment of a waterbody, where hydrological or other factors make a broadly-applicable standard unacceptable.

Water quality standards for the Bay Delta Estuary waters are contained in three separate water quality control plans: (1) the State Board's 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (2006 WQCP), (2) Central Valley RWQCB's 2009 Sacramento River and San Joaquin River Water Quality Control Plan and (3) San Francisco Bay RWQCB's 2007 Water Quality Control Plan for the San Francisco Bay Basin. These plans contain water quality standards for the Bay Delta Estuary, including designated uses and water quality criteria. The State Board's 2006 WQCP is the final authority with respect to any overlap between the Regional Water Boards' water quality control plans. Collectively, these water quality control plans identify designated uses for Bay Delta Estuary waters that include: municipal, domestic, industrial, and agricultural water supply, groundwater recharge, navigation, water recreation, and fishing, and warm and coldwater habitat, migration habitat, spawning and reproduction habitat, wildlife, estuarine, and rare, threatened and endangered species habitat.

Narrative and numeric water quality criteria are established in each of the three water quality control plans to protect designated uses. The State Board's 2006 WQCP establishes flow criteria while the Regional Boards' plans contain contaminant criteria.<sup>59</sup> The 2006 WQCP protects fish and wildlife designated uses with ten water quality criteria focused on controlling levels of salinity, dissolved oxygen, and flow characteristics (volume, frequency, duration, timing, and direction of flow). The majority of criteria set numeric limits for the allowable amounts of pollutants (e.g., salinity or dissolved oxygen) or establish flow restrictions or characteristics that must be met at specific locations and times throughout the Delta based on the type of water year.<sup>60</sup> The Regional Boards' plans use narrative criteria for broad categories such as toxicity and use numeric criteria for specific contaminants such as chlorpyrifos and ammonia.

## **b. Point Source Regulation under the Clean Water Act**

The Clean Water Act requires EPA (or, in the case of delegated states such as California, the State) to control point source discharges through the issuance of NPDES permits, which may be issued for fixed terms that may not exceed five years.<sup>61</sup> EPA has issued comprehensive regulations that implement the NPDES program at 40 CFR part 122. The Clean Water Act also provides for the development of technology-based and water quality-based effluent limitations that are imposed through NPDES permits to control the discharge of pollutants from point sources.<sup>62</sup>

The Clean Water Act directs EPA to promulgate effluent limitations guidelines and standards (effluent guidelines) that reflect pollutant reductions that can be achieved by categories or subcategories of industrial point sources using technologies that represent the appropriate level of control.<sup>63</sup> For point sources that introduce pollutants directly into the waters of the United States (direct dischargers), the effluent limitations guidelines and standards promulgated by EPA are implemented through NPDES permits.<sup>64</sup> For sources that discharge to Publicly Owned Treatment Works (POTWs) (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities.<sup>65</sup>

Two particular types of point source discharges are of particular interest in the Bay Delta Estuary. First, discharges from POTWs have been identified as possible contributors to impairments in the Bay Delta Estuary. There are ten POTWs discharging into the Bay Delta Estuary with a discharge capacity of 10 million gallons/day or more.<sup>66</sup> In recent years, the Water Boards have been updating and, generally, strengthening effluent discharge restrictions in some of the NPDES permits.<sup>67</sup> For example, the renewal of the City of Stockton's Waste Water Treatment Plant NPDES permit in 2002<sup>68</sup> and subsequent Cease and Desist Order<sup>69</sup> required a wastewater treatment plant upgrade including nitrification facilities to meet effluent restrictions on ammonia/ammonium discharges and protect downstream designated uses.

The second type of discharge particularly relevant in the Bay Delta Estuary is stormwater discharge. In 1987 Congress amended the Clean Water Act, adding section 402(p) which created a phased approach to the regulation of stormwater discharges under the Clean Water Act. EPA's Phase I stormwater regulations in 1990 established requirements for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipal separate storm sewer systems (MS4s) and discharges associated with industrial activity.<sup>70</sup> In its 1999 Phase II stormwater regulations, EPA designated discharges associated with small construction activity and discharges from small MS4s (less than 100,000 people and located within an urbanized area defined by the Bureau of the Census) for regulation under the Clean Water Act.<sup>71</sup> In certain situations, a stormwater discharge may be more appropriately and effectively regulated by an individual permit, a region-specific general permit, or by inclusion in an existing Phase I permit. Thus, under current EPA regulations, there are three general categories of stormwater discharges that are directly regulated by EPA and California under the Clean Water Act: discharges from MS4s, discharges associated with construction activity, and discharges associated with industrial activity.<sup>72</sup> In California, permits for discharges of stormwater are issued by the Regional Water Boards or the State Board.

*Discharges from MS4s:* An “MS4” is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) owned or operated by a public body; (ii) designed or used for collecting or conveying stormwater; (iii) which is not a combined sewer; and (iv) which is not part of a Publicly Owned Treatment Works (POTW).<sup>73</sup> In California, large and medium MS4s obtain individual NPDES permits from the Regional Water Boards. The Central Valley RWQCB issues permits to the majority of the stormwater discharges from MS4s to the Bay Delta Estuary and its tributaries. Small MS4s include systems similar to general municipal storm sewer systems, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares, but do not include separate storm sewers in very discrete areas, such as individual buildings.<sup>74</sup> In 2003, the State Board adopted a statewide general permit for discharges from small MS4s.<sup>75</sup>

*Stormwater Discharges Associated with Construction Activity:* Discharges associated with “large” construction activity includes those discharges associated with clearing, grading, and excavation of five acres or greater of total land area.<sup>76</sup> Discharges associated with “small” construction activity includes those discharges associated with clearing, grading and excavation that results in land disturbance of equal to or greater than one acre and less than five acres.<sup>77</sup> In California, stormwater discharges from construction sites are permitted by individual NPDES permits issued by the Regional Boards or the California Construction General Permit<sup>78</sup> issued by the State Board.

*Stormwater Discharges Associated with Industrial Activity:* Discharges associated with industrial activity include those from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant as laid out at 40 C.F.R. 122.26(b)(14)(i)-(x). In California, stormwater discharges associated with industrial activity are permitted by individual NPDES permits issued by the Regional Boards or the California Industrial Stormwater General Permit (97-03-DWQ) issued by the State Board.

In addition to the above three general categories of stormwater discharges subject to regulation, both EPA and California have the authority to require NPDES permits for additional stormwater discharges that are currently not directly regulated under the Clean Water Act by using their residual designation authority. EPA and/or California may require a permit for an unregulated stormwater discharge if it determines that either (1) stormwater controls are needed for the discharge based on waste load allocations that are part of total maximum daily loads that address the pollutant(s) of concern; or (2) the discharge or category of discharges within a geographic area contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.<sup>79</sup> Additionally, EPA or California may designate small MS4s whose discharges are currently unregulated for NPDES permit coverage.<sup>80</sup>

### **c. Total Maximum Daily Loads (TMDLs)**

Regulation of point sources is not always sufficient to attain ambient water quality standards in all waterbodies. Clean Water Act Section 303(d)(1)(A) requires each state to



identify and prioritize those waters where technology-based controls are inadequate to attain WQS:

Each State shall identify those waters within its boundaries for which the effluent limitations required by section 1311(b)(1)(A) and section 1311(b)(1)(B) of this title are not stringent enough to implement any water quality standards applicable to such waters. The State shall establish a priority ranking of such waters, taking into account the severity of the pollution and the uses to be made of such waters.<sup>81</sup>

The state's identification of such impaired waters constitutes the "303(d) list."<sup>82</sup> States have been required, since 1992, to submit their 303(d) lists to EPA for review and approval every two years.<sup>83</sup> If it disapproves a state's list, EPA must establish a list for the state.<sup>84</sup>

For all waters identified under Section 303(d)(1)(A) as exceeding water quality standards, the Act provides:

Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.<sup>85</sup>

The term "total maximum daily load" (TMDL) is not explicitly defined in the Clean Water Act. EPA's current regulations define a TMDL for a pollutant as the sum of the "wasteload allocations" allocated to point sources, the "load allocations" allocated to nonpoint sources or natural background, and a margin of safety.<sup>86</sup> Therefore, a TMDL identifies the maximum amount of a pollutant that can be added to a waterbody (loading capacity) without exceeding water quality standards.<sup>87</sup>

States must establish TMDLs for waters where pollutants are "preventing or expected to prevent attainment of water quality standards."<sup>88</sup> Under Section 303(d)(2), EPA is required to review and approve or disapprove TMDLs established by states for listed waters.<sup>89</sup> In its review, EPA takes into consideration the legal and technical adequacy of the TMDL, which includes elements identified above and an implementation schedule. If it disapproves a state TMDL, EPA must establish the TMDL.<sup>90</sup> Implementation is the responsibility of states. In California, the Porter-Cologne Water Quality Control Act requires that a TMDL include an implementation plan.

TMDLs established pursuant to Section 303(d)(1) for impaired waters are not self-executing. Limitations in loadings identified for point sources (waste load allocations) are enforced through permits issued pursuant to Section 402 of the Act.<sup>91</sup> Limitations in loadings identified for nonpoint sources (i.e., "load allocations"), on the other hand, may only be "required" under state law.<sup>92</sup>

All of the waters within the Bay Delta Estuary are listed as impaired by at least one factor, either due to the presence of pollutants at unacceptable levels or the lack of maintaining certain conditions such as adequate levels of dissolved oxygen. The “303(d) list” of impaired waterbodies was last approved by EPA in 2007. The State Board revised and adopted a new 303(d) list in August 2010, and has submitted that list to EPA for its review and approval. On November 12, EPA partially approved and partially disapproved California’s list, adding additional water bodies and pollutants.<sup>93</sup>

In California, TMDLs are developed by the Regional Boards but are not final until approved by State Board and EPA. EPA has approved TMDLs for salinity, boron, mercury, selenium, diazinon, chlorpyrifos, pathogens and low dissolved oxygen to address impairments affecting the Delta. The Central Valley RWQCB is developing a salinity TMDL for the San Joaquin River upstream of Vernalis, as well as a pesticides TMDL for the Central Valley.<sup>94</sup>

#### **d. Nonpoint Source Management Program**

Nonpoint source pollution – pollution caused by a wide range of activities including urban development, agriculture and forestry – is a major cause of water quality impairment nationally and in California. Two primary federal statutes establish a framework in California for addressing nonpoint source water pollution: Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). Together these statutes require the state to assess water quality problems associated with nonpoint source pollution and to develop programs to address these challenging problems. EPA oversees these nonpoint source programs and provides funding to the state for program implementation.

California’s Porter-Cologne Water Quality Control Act designates the Water Boards as the state agencies with primary responsibility for water quality control in California and obligates them to address all discharges of waste that could affect the quality of the waters of the state, including potential nonpoint sources of pollution. The Porter-Cologne Water Quality Control Act’s scope and implementation authorities are significantly broader than those found in the federal Clean Water Act. In addition to using the Porter-Cologne Water Quality Control Act’s planning, permitting, and enforcement authorities to prevent and control nonpoint sources of pollution, the Water Boards have implemented a program of outreach, education, technical assistance and financial incentives.

California submitted an “upgraded” nonpoint source pollution control program to EPA and the National Oceanic and Atmospheric Administration (NOAA) on February 4, 2000. The *Plan for California’s Nonpoint Source Pollution Control Program (Program Plan)* was jointly submitted by the State Board and the California Coastal Commission (CCC) to satisfy the requirements of the Clean Water Act Section 319 and CZARA Section 6217. NOAA and EPA found that California satisfied all conditions of program approval pursuant to CZARA Section 6217, set forth in the *Findings on the California Coastal Nonpoint Program*, transmitted to the State on July 17, 2000. Furthermore, EPA found that the Program Plan successfully incorporates the nine key elements pursuant to Clean Water Act Section 319, which characterize an effective and dynamic state nonpoint source program. The California Nonpoint Source Pollution Control Program was fully approved pursuant to CZARA Section 6217 and Clean Water Act Section

319. As a result, California has continued to receive at least \$10 million from EPA annually to implement the nonpoint source program.

#### **e. Wetlands Program under Section 404**

Section 404 of the Clean Water Act regulates the discharge of dredged and fill materials into waters of the United States.<sup>95</sup> Activities regulated under Clean Water Act Section 404 include discharging fill material (e.g., dirt) into waters for urban development, water resource projects (dams, levees, canals, and pipelines), infrastructure (utilities, roads, airports), and mining (in-stream gravel mining, tailings discharge from mountaintop coal mining). Section 404 requires a permit to be issued before dredged or fill material may be discharged into waters of the United States.

Clean Water Act Section 404 protects water quality by restricting the destruction (fill) of aquatic resources that maintain and improve water quality and serve other important functions.<sup>96</sup> Clean Water Act Section 404 prohibits granting a permit for the discharge of fill material into waters of the United States when there is a practicable alternative that is less damaging to the aquatic environment and when the proposed discharge would significantly degrade aquatic or other natural resources.<sup>97</sup> EPA promulgated the Section 404(b)(1) Guidelines to implement these basic concepts.

Administration of Clean Water Act Section 404 is divided between the U.S. Army Corps of Engineers (Corps) and EPA. The Corps administers the permitting program by processing individual and general permits, determining Clean Water Act jurisdiction, and conducting compliance assistance. The Corps writes regulations and develops national and district policies. EPA is responsible for oversight, including writing regulations that must be followed in issuing 404 permits, developing policy and guidance, determining the scope of geographic jurisdiction, reviewing and commenting on individual permit applications, conducting enforcement actions against unpermitted fill activities, and, where appropriate, objecting to or vetoing individual 404 permits.

Fill activities that destroy wetlands and other slow-moving waterways are relevant to water quality, in that wetlands, sloughs, mudflats, floodplains, and similar aquatic resources perform water filtration services that reduce common types of water pollution, like excessive nutrients, sediment, municipal sewage, pesticides, and toxicity events. Wetlands, sloughs, and floodplains are flat areas where water moves slowly, allowing sediment to drop out of the water column and deposit on the bottom. Nutrients and other contaminants from pesticide and fertilizer application, animal waste, septic tanks, stormwater and municipal sewage are often absorbed by plant roots and microorganisms in the soil while other pollutants stick to sediment particles.<sup>98</sup> Wetlands can be so effective at removing pollutant loads that artificial wetlands are occasionally constructed to treat stormwater and wastewater.

Wetlands, sloughs and floodplains also provide important floodwater storage and aquatic habitat services, by absorbing flood waters in times of high precipitation and slowly releasing them back into the larger tributary system. This important service not only mitigates the economic damage of floods, it improves the quality of flood waters by allowing pollutants to

settle out and be processed by vegetation and/or sediment microorganisms. These aquatic resources also provide necessary spawning, forage, and refuge habitat for fish and wildlife. Clean Water Act Section 404 protects these services by limiting the discharge of dredged and fill material and the subsequent destruction of wetlands.

#### **f. State Water Quality Certification Program under Section 401**

The Clean Water Act Section 401 water quality certification program provides states with an opportunity to address aquatic resource impacts from federally issued permits and licenses. Section 401 restricts federal agencies from issuing a permit or license for any activity that may result in a discharge to waters of the United States from a point source until the state certifies that the proposed discharges do not violate water quality protection provisions. States have several options under the Clean Water Act Section 401 program. They can (1) grant certification, (2) grant certification with conditions, (3) deny certification, or (4) waive the requirement for certification. In California, the federal licenses and permits most frequently requiring Section 401 certification include Clean Water Act Section 404 permits, Federal Energy Regulatory Commission (FERC) hydropower licenses, and Rivers and Harbors Act Section 9 and 10 permits issued by the Corps.

## **2. Pesticide Regulation under the Clean Water Act and FIFRA**

Pesticides are being discussed separately in this notice because they are regulated under at least two major statutes that take different approaches to regulation. First, some pesticides are classified as pollutants pursuant to the Clean Water Act, and, as such, are subject to the Clean Water Act programs outlined above (water quality standards, NPDES permits, TMDLs, nonpoint source management programs, etc.)

Pesticides are also regulated under Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Under FIFRA Section 3, every pesticide product must be registered with EPA or specifically exempted under FIFRA Section 25(b) before being sold or distributed in the United States. An applicant for a new registration or an existing registrant (collectively referred to as applicant here) must demonstrate to EPA's satisfaction that, among other things, the pesticide product, when used in accordance with widespread and commonly recognized practice, will not cause "unreasonable adverse effects" to humans or the environment. This safety determination requires EPA to weigh the risks of the use of the pesticide against any benefits. EPA must determine that the standard for registration contained in FIFRA is met before granting a registration. The three primary action points for EPA under FIFRA are registration, reregistration, and registration review.

1. *Registration.* Section 3 of FIFRA contains the requirements for registration. FIFRA Section 3(c)(2) provides EPA broad authority, before and after registration, to require scientific testing and submission of the resulting data to EPA by applicants for registration of pesticide products. An applicant must furnish EPA with data on the pesticide, its composition, toxicity, potential human exposure, environmental properties, and ecological effects, as well as information on its product performance (efficacy) in certain cases. Although the data requirements are imposed

primarily as a part of initial registration, EPA is authorized under FIFRA Section 3(c)(2)(B) to require a registrant to develop and submit additional data to maintain a registration.

2. *Reregistration.* FIFRA Section 4 requires that EPA reregister each pesticide product first registered before November 1984. This date was chosen because pesticides registered before then, were not subject to the more stringent 1984 regulation review process. EPA has completed the reregistration/tolerance reassessment process for food use pesticides and expects to complete all reregistration activities by 2014.

3. *Registration review.* FIFRA section 3(g) mandates that all pesticide registrations are to be periodically reviewed. Changes in science, public policy, and pesticide use practices occur over time. Through the new registration review program implemented via a regulation promulgated in 2006,<sup>99</sup> EPA periodically reevaluates all registered pesticides to assure that they continue to meet the statutory standard of “no unreasonable adverse effects.” Starting in 2006, registration review began to replace EPA’s reregistration program as the mechanism for systematic review of existing pesticides.

A major component of the FIFRA program for protecting sensitive species is the reliance on pesticide container labeling to disseminate use restrictions. In addition to label instructions physically attached to pesticide containers, users are required to comply with geographically specific use limitations, if any, that are reflected in EPA’s Endangered Species Protection Bulletins. Users are required to follow label and Bulletin instructions or they are subject to enforcement actions under the misuse provisions of FIFRA.

As discussed in detail below, pesticide registration for pesticides affecting Bay Delta Estuary aquatic resources has been the subject of intensive review and litigation in recent years.

### **III. Program Areas for Public Comment**

In this ANPR, EPA is asking the public to consider broadly whether EPA should be taking new or different actions under its programs to address problems in the Bay Delta Estuary. EPA is not limiting its request to actions that would require actual rulemaking; there may be a range of changes in EPA’s activities in the Bay Delta Estuary that would be constructive, including enforcement, research, revisions to water quality standards, etc. Any change in EPA activities would be dependent on existing authority and the availability of existing or new resources. Any changes requiring EPA rulemaking would provide for public comment through the notice and comment rulemaking process.

A substantial amount of research was performed and evaluated in connection with the scientific review of the pelagic organism decline. As noted above, that process identified a number of potential stressors affecting the Bay Delta Estuary aquatic ecosystem. Many of those potential stressors are directly or indirectly affected by the EPA programs described above. EPA has identified certain topics for more focused consideration in this ANPR. These are:

- Ammonia
- Selenium

- Pesticides
- Contaminants of Emerging Concern
- Protecting Estuarine Habitat
- Protecting Fish Migration Corridors
- Protecting Wetlands

EPA has not made any attempt to rank these topics as to their importance in resolving Bay Delta Estuary issues.<sup>100</sup> EPA's preliminary evaluation suggests that each of these topics, if addressed, could contribute to a resolution of Bay Delta Estuary resource conflicts. While this ANPR discusses these topics separately, EPA is mindful that the more significant concern is the cumulative and interactive effects of multiple stressors, as discussed above, on the Bay Delta Estuary's aquatic inhabitants.

Commenters may also identify additional topics that impact Bay Delta Estuary resource management, if EPA has some programmatic involvement in the topic.

## **A. Contaminants**

Poor water quality in the Bay Delta Estuary and its tributaries affects terrestrial and aquatic ecosystems, drinking water, recreation, industry, agriculture, and the local, state, and interstate economy. The State of California collects data on contaminants that degrade water quality to generate its Clean Water Act Section 303(d) list of water bodies with designated use impairments. All Bay Delta Estuary waters are impaired due to many different contaminants, including pesticides, manufacturing compounds, metals (including selenium), pathogens, nutrients/low dissolved oxygen, invasive species, salinity, and toxicity from unknown sources.<sup>101</sup> Some pesticides and metals are legacy problems, such as the banned organochlorine pesticide DDT and mercury from abandoned mines. Most contaminants contributing to poor water quality in the Bay Delta Estuary are the result of current-use compounds from industrial, agricultural, urban, transportation, and natural sources. In addition, there is growing concern about new classes of contaminants, such as pyrethroid pesticides, pharmaceuticals and personal care products.

Contaminant "toxicity" refers to effects ranging from death to behavioral abnormalities or other impairments to growth, reproduction and survival.<sup>102</sup> Numeric water quality criteria are usually identified for individual chemicals as concentrations that protect designated uses from toxicity due to short-term (acute) exposure and longer-term (chronic) exposure. In recent years, more attention has turned to the potential for contaminants, individually or in combination in the aquatic environment, to produce "sub-lethal" effects (e.g., glycogen depletion, cellular stress, impaired swimming ability, reduced reproductive success) that can lead to declining populations in sensitive species.

It is difficult to evaluate and address contaminants in the Bay Delta Estuary in the absence of a comprehensive monitoring program. Some contaminants are monitored only on an incidental or occasional basis, or not at all. Consistent monitoring data over any particular time period is simply unavailable. Monitoring data is collected by multiple agencies, with little standardization of monitoring procedures, data quality assurance or presentation protocols, and is

not readily accessible in any single database. This makes data interpretation difficult. EPA is working with the Water Boards and other partners to develop a comprehensive Regional Monitoring Program to address these problems.

Contaminants are considered one of the contributing factors in the abrupt drop in pelagic organisms. The IEP's Pelagic Organism Decline science review is investigating how individual contaminants affect pelagic species. Initial studies have somewhat conflicting conclusions. One study evaluated historic monitoring data of contaminants and Bay Delta Estuary organism population estimates and concluded that direct toxicity to POD species from contaminants in Bay Delta Estuary waters is unlikely to be the cause of the recent large population declines. That study also concluded, however, that contaminants cannot be ruled out as a major contributor to the POD due to the potential for direct toxicity to POD food sources and gaps in monitoring data that prevent a more complete evaluation.<sup>103</sup> Another study used statistical methods to evaluate the relationships between the POD and various hypothesized causes such as contaminants and water exports out of the Bay Delta Estuary. This statistical analysis suggested that contaminant loadings of ammonia and ammonium to the Bay Delta Estuary are more highly correlated with the POD than water exports over a 30-year period.<sup>104</sup> Other important studies show high levels of toxicity to aquatic invertebrates from urban stormwater pyrethroid pesticide loadings to Bay Delta Estuary tributaries<sup>105</sup> and sub-lethal, population-level impacts to sport fish from the mixture of contaminants in Bay Delta Estuary waters.<sup>106</sup>

The existing research indicates that contaminants are likely contributors to the POD and ecosystem collapse. It is a complex task to determine which of the contaminants in the Bay Delta Estuary are individually, or in combination with one another, or under specific physical conditions, responsible for the POD and current state of the Bay Delta Estuary aquatic ecosystem. A list of contaminants has emerged as potentially significant, including ammonia and ammonium, selenium, and pesticides. Another group of contaminants, usually containing some hormonally-active ingredients, are considered "contaminants of emerging concern" (CECs). The following sections examine these contaminants with respect to impacts to Bay Delta Estuary aquatic resources and source control provided by the current regulatory framework.

## **1. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What contaminants, other than those named above, are causing adverse impacts to aquatic resource designated uses in the Bay Delta Estuary and should receive more focused review?
2. How can pollutant-specific water quality criteria effectively address or incorporate interactive effects between multiple contaminants and other physical, chemical, and biological stressors?
3. What methods can be used in developing and implementing TMDLs to effectively address or incorporate interactive effects between multiple contaminants and other physical, chemical, and biological stressors on individual water bodies or for water bodies within a watershed?
4. What information exists about how climate change impacts will effect contaminant pollution (generally or for individual contaminants)?

## **2. Ammonia: Toxic and Nutrient Effects**

### **a. Aquatic Resource Issues**

#### ***Background***

Total ammonia nitrogen in aquatic systems is both a toxic substance and a source of nutrients for aquatic plants, depending on its form. Ammonia is a chemical compound containing nitrogen that exists in two forms in water, un-ionized ammonia ( $\text{NH}_3$ ) gas and dissolved ionized ammonium ( $\text{NH}_4^+$ ).<sup>107</sup> This document will use the term un-ionized ammonia to refer to ammonia gas ( $\text{NH}_3$ ), ammonium to refer to the ammonium ion ( $\text{NH}_4^+$ ) and total ammonia nitrogen to refer to the combination of ammonia and ammonium. Un-ionized ammonia gas is toxic to vertebrates<sup>108</sup> and ammonium is a source of nitrogen, a necessary nutrient, for aquatic plants. Total ammonia nitrogen is the term used to inclusively refer to both un-ionized ammonia gas and ammonium and their collective impacts.

Total ammonia nitrogen toxicity is primarily a function of pH but also depends on temperature and salinity. Total ammonia nitrogen is toxic to all forms of aquatic life.<sup>109</sup> Un-ionized ammonia is considerably more toxic to vertebrates than ammonium; toxicity increases with pH as the proportion of un-ionized ammonia to ammonium increases. Toxicity decreases with pH as the proportion of ammonium rises. Nevertheless, ammonium makes a relevant contribution to total ammonia nitrogen toxicity. Toxic effects of total ammonia nitrogen exist at lower pH<sup>110</sup> and some aquatic invertebrates may be more sensitive to ammonium than to un-ionized ammonia.<sup>111</sup>

Un-ionized ammonia is especially harmful to vertebrates in aquatic environments where ambient total ammonia nitrogen levels can become concentrated. High levels of un-ionized ammonia gas in water reverse the diffusive gradient of un-ionized ammonia movement out of cells, leading to a rise of ammonia gas in the blood stream, which causes cell death in the central nervous system, convulsions, coma and death.<sup>112</sup> Non-lethal impacts of ammonia gas on fish



include swelling and thickening of gills, respiratory and oxidative stress, and increased occurrences of gill disease from parasites and harmful bacteria.<sup>113</sup>

Around the country, excessive total ammonia nitrogen is a water pollution problem because it is a source of nitrogen. Although some amount of nitrogen is necessary for plant growth, elevated amounts can inhibit plant growth. Excessive nitrogen stimulates harmful blooms of some types of algae (phytoplankton), which in turn reduce dissolved oxygen during algae decomposition and can lead to die-offs of aquatic animals. Elevated levels of ammonium are also known to inhibit growth of some types of desirable estuarine phytoplankton such as diatoms. These conditions reduce ecosystem biodiversity and stability after prolonged periods. Harmful algal blooms also cause taste and odor problems in drinking water and cause respiratory distress and neurological problems in human recreational users.<sup>114</sup>

One unique characteristic of the Bay Delta Estuary is that it has both excessive nutrient loadings and low phytoplankton primary productivity. The Bay Delta Estuary is one of the least productive tidal estuaries in the world. Between the late 1970's and 1990's phytoplankton biomass and photosynthetic productivity declined 60% and 40% respectively.<sup>115</sup> Ammonium loadings to the Bay Delta Estuary have increased since the 1980's and may be one reason why phytoplankton biomass and productivity have decreased. Excessive nutrients are often associated with high primary productivity and algal blooms. In the Bay Delta Estuary, however, nutrient (ammonium) concentrations are high enough to inhibit growth of diatoms, important algae in the food web.<sup>116</sup>

Total ammonia nitrogen sources in the Bay Delta Estuary include wastewater treatment plants and agricultural and urban runoff containing ammonium fertilizers and animal waste. The largest total ammonia nitrogen point sources affecting the Bay Delta Estuary are wastewater treatment plants.<sup>117</sup>

### ***Total Ammonia Nitrogen and the Decline of Bay Delta Estuary Pelagic Organisms***

Total ammonia nitrogen discharges to the Bay Delta Estuary are one of the potential contributors to the long-term decline and recent collapse of pelagic organism populations and the Bay Delta Estuary food web. The relationship between total ammonia nitrogen levels and plunging fish populations is being actively investigated by the U.S. Geological Survey (USGS), the State Board, the Central Valley RWQCB, the Interagency Ecological Program, academic research groups, and some water supply agencies. Collectively, these research efforts suggest that total ammonia nitrogen concentrations in the Bay Delta Estuary may be contributing to the decline in pelagic fishes through one or more of the following mechanisms: (1) direct toxicity to pelagic fishes; (2) toxicity to pelagic organism food sources; (3) increased toxicity to pelagic organisms in the presence of other contaminants or physical conditions; and/or (4) by contributing to trophic (ecosystem) food web changes that negatively impact resource availability for pelagic species.<sup>118</sup>

Total ammonia nitrogen levels observed in the Bay Delta Estuary may be directly toxic to pelagic species, such as delta smelt, and their food sources. Increases in total ammonia nitrogen loadings to the Bay Delta Estuary are correlated with decreases in fish<sup>119</sup> and copepod

populations;<sup>120</sup> however, the relative contribution of total ammonia nitrogen versus other variables (hydrologic modification, water exports, invasive species, other contaminants) to the pelagic organism decline is unclear.

Completed toxicity investigations on delta smelt suggest that ambient total ammonia nitrogen concentrations present in the Bay Delta Estuary do not cause acute toxicity in delta smelt.<sup>121</sup> Chronic toxicity conditions for delta smelt potentially exist when pH is greater than 8.0;<sup>122</sup> however, the Central Valley RWQCB reports that pH levels in the Delta do not often exceed 8.0.<sup>123</sup>

Ambient total ammonia nitrogen levels in the Bay Delta Estuary may be contributing to acute and chronic toxicity in copepods, an important pelagic fish food source. Ten percent mortality was observed in copepods at ambient Bay Delta Estuary concentrations, indicating the potential for acute total ammonia nitrogen toxicity.<sup>124</sup> Preliminary experimental data show a negative effect on copepod reproduction and survival rates at ambient ammonia concentrations commonly observed in the Bay Delta Estuary.<sup>125</sup>

The toxic effect of total ammonia nitrogen on pelagic species and food sources may occur at lower concentrations than established toxicity endpoints when present with other contaminants or due to differences between toxicity testing and exposure in natural environments. Multi-pollutant experiments show that copepods may be considerably more sensitive to total ammonia nitrogen concentrations in the presence of copper and pesticides.<sup>126</sup> Methods for establishing toxicity end points use delta smelt larvae reared in hatcheries that may be healthier and less vulnerable to pollutant exposures than delta smelt larvae reared in the Bay Delta Estuary exposed to a mixture of pollutants from the start of their life cycle. Similarly, toxicity identification experiments for individual species generally use non-swimming fish even though there is evidence that swimming, unfed fish may be several times more sensitive to ambient ammonia levels than laboratory exposures.<sup>127</sup>

Abundant nitrogen from increased ammonium discharges into Bay Delta Estuary waters may be a significant variable contributing to changes that negatively impact the food supply for pelagic organisms. The Bay Delta Estuary is characterized by some of the lowest photosynthetic (primary) productivity by phytoplankton in tidal systems globally. Phytoplankton productivity is the food supply for higher trophic level pelagic organisms. Ammonium loadings and other stressors to the Bay Delta Estuary have increased since the 1980's while phytoplankton biomass and productivity have decreased. Ammonium concentrations that inhibit phytoplankton growth rates are frequently present in the Bay Delta Estuary<sup>128</sup> along with multiple other stressors, such as high filtering rates from introduced clams, hydromodification, and presence of other contaminants that affect food web biomass and composition.<sup>129</sup>

The phytoplankton community in the Bay Delta Estuary has changed from one dominated by diatoms to one dominated by blue-green algae and flagellate phytoplankton species.<sup>130</sup> Diatoms were the primary food item for the calanoid copepod *Eurytemora affinis*, an important food source for pelagic fish.<sup>131</sup> Copepods prefer diatoms over blue-green algae and flagellates<sup>132</sup> potentially because diatoms are more nutritious, containing greater amounts highly unsaturated

fatty acids than blue-green algae,<sup>133</sup> and calanoid copepods cannot capture small particles such as nutritionally rich nanoflagellates.<sup>134</sup>

The long-term decrease in phytoplankton biomass coupled with the change from a diatom-dominated community to blue-green algae and flagellate-dominated community represents a reduction in quality and quantity at the base of the food web that may affect fish populations. Diatoms are food for copepods; copepods are food for forage fish and other pelagic species; forage fish are food for both native and non-native fish species. As diatom biomass declined, so did some populations of copepods and crustaceans.

Increased loadings of total ammonia nitrogen to the Bay Delta, along with other variables, may contribute to the reduction of pelagic food sources and subsequently pelagic fish populations by supporting the growth of blue-green algae and suppressing growth of diatoms. Long-term population declines of Bay Delta Estuary pelagic fishes are correlated with long-term increases in wastewater effluent and ammonium loadings to Bay Delta Estuary waters.<sup>135</sup> Flagellates and blue-green algae may out-compete diatoms by preferentially using nitrogen in the form of ammonium,<sup>136</sup> while diatoms more easily use nitrogen in the form of nitrate.<sup>137</sup> Ambient ammonium levels in the Bay Delta Estuary inhibit diatom uptake of nitrate, suppress diatom growth, and prevent spring time diatom blooms that support higher trophic level pelagic species.<sup>138</sup> Phytoplankton composition and declining pelagic fish populations are also correlated with Bay Delta Estuary flows and water temperature.<sup>139</sup>

A recent important change in the Bay Delta Estuary food web composition is the increase in abundance of toxic blue-green algae, *Microcystis aeruginosa* (*Microcystis*). Blooms of *Microcystis* were first observed in 1999 and have quickly spread throughout the central and southern Delta. *Microcystis* exists as an algae layer on the water surface that impairs recreation activities, reduces dissolved oxygen, causes taste and odor problems in drinking water and toxicity problems in fish. Microcystin, the toxin produced by *Microcystis*, promotes tumors in fish, has been measured in phytoplankton, zooplankton, and fish tissue in the Bay Delta Estuary, and may be negatively impacting the health of striped bass and other Bay Delta Estuary fish.<sup>140</sup> Estuarine fisheries may be impacted by *Microcystis* through direct toxicity from microcystin and/or indirectly through food web impacts from degraded nutritional value. *Microcystis* blooms are occurring with increasing frequency in the Bay Delta Estuary.<sup>141</sup> Some data show positive correlations between ammonia loadings to the Bay Delta Estuary and *Microcystis* abundance and distribution.<sup>142</sup> However, other research shows that high water temperature and stream flow has a stronger relationship with *Microcystis* cell density than nutrient loadings to the Bay Delta Estuary.<sup>143</sup>

## **b. Regulatory Status**

### **i. Water Quality Standards**

Water Quality Control Plans are written by the Water Boards and contain the state and region's applicable water quality standards, which are composed of designated uses and narrative or numeric criteria for regulated pollutants. Neither the State Board nor the Central Valley RWQCB has adopted narrative or numeric criteria specifically for total ammonia nitrogen, unionized ammonia or ammonium. They do, however, contain narrative toxicity criteria that

prohibit concentrations of toxic substances that cause acute or chronic toxicity to aquatic life. The San Francisco RWQCB adopted numeric criteria for un-ionized ammonia concentrations (0.025 mg/L annual median) but the San Francisco Bay Water Quality Control Plan does not have numeric or narrative criteria for total ammonia nitrogen or ammonium.<sup>144</sup>

EPA publishes and periodically updates its recommended aquatic life water quality criteria to reflect the latest scientific knowledge. These criteria are a guide for states, territories, and tribes to develop water quality standards and a foundation for controlling discharges of total ammonia nitrogen into waterways. The 1999 EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – the most recent final recommended criteria for ammonia – identifies the chronic limit for total ammonia nitrogen as 1.3 mg/L (measured by milligrams of nitrogen per liter of water at pH 8.0 and temperature 25 degrees Celsius).<sup>145</sup> The acute limit is 5.6 mg/L under the same test conditions.<sup>146</sup> Monitoring data indicate that Sacramento River and Bay Delta Estuary total ammonia nitrogen concentrations are below the 1999 EPA-recommended numeric water quality criteria for ammonia.<sup>147</sup>

Recent independent investigations in the Bay Delta Estuary raise the possibility that the 1999 EPA ammonia criteria may not be protective of pelagic species in the Bay Delta Estuary. The lethal concentration of total ammonia nitrogen for two copepod species, *Eurytemora affinis* and *Psuedodiaptomus forbesi* (important pelagic fish food sources) occurs at or below the calculated 1999 EPA ammonia criteria, and the estimated chronic criterion concentration (CCC) for these copepods is below the 1999 EPA chronic ammonia criteria.<sup>148</sup> A study at the University of California concluded that the chronic 1999 EPA ammonia criteria may not be protective of delta smelt because the lethal concentration of un-ionized ammonia for delta smelt is approaching the chronic criteria at high pH (8.3).<sup>149</sup> This study may not be conclusive in the Bay Delta Estuary because the Central Valley RWQCB found that pH values above 8.0 are rare in the Sacramento River downstream of the Sacramento Regional Wastewater Treatment Plant.<sup>150</sup>

EPA proposed to update the recommended Ammonia Aquatic Life Criteria on December 20, 2009. The proposed acute limit is 2.0 mg/L (25 degrees Celsius, pH 8.0, mussels present); the proposed chronic limit is 0.26 mg/L (25 degrees Celsius, pH 8.0, mussels present).<sup>151</sup> Once final, the updated EPA criteria are not effective in California until the Water Boards adopt them as a change to their Basin Plans, the Water Boards use the updated criteria in effluent limitations in permits for point source discharges, or the EPA promulgates the updated criteria as a water quality standard for California.

It is unclear whether total ammonia nitrogen levels in the Bay Delta Estuary would meet or exceed the proposed 2009 Ammonia Aquatic Life Criteria. A Central Valley RWQCB field study shows that ambient ammonia concentrations measured in the Bay Delta Estuary between March 2009 and February 2010 did not exceed the proposed 2009 chronic ammonia criteria.<sup>152</sup> Contrary information submitted to the Central Valley RWQCB suggests that total ammonia nitrogen concentrations immediately outside of the Sacramento RWTP mixing zone would have exceeded the proposed 2009 criteria 21 per cent of the time between 2007 and 2008 and 41 per cent of the time in 2009.<sup>153</sup>

## **ii. Point Source Ammonia Discharges**

Regulating point source discharges of total ammonia nitrogen is a major component of the water quality regulatory approach in the Bay Delta Estuary. The Water Boards directly control point sources of total ammonia nitrogen through ammonia effluent limits in NPDES permits. In the absence of numeric ammonia criteria, these permits are generally designed to meet the narrative toxicity criteria. NPDES permit limits for ammonia are site-specific and are based on the 1999 EPA Aquatic Life Ambient Water Quality Criteria for Ammonia, the narrative toxicity criteria, effluent ammonia concentrations from the discharge source, concentration of total ammonia nitrogen in the receiving water body, and available dilution.

The major ammonia point sources affecting the Bay Delta Estuary are publicly owned treatment works (POTWs). The table below shows the permit status of these facilities. The two largest POTWs discharging treated sewage to the Bay Delta Estuary are the Sacramento Regional Wastewater Treatment Plant (WWTP) and the Stockton Regional Wastewater Control Facility (WWCF). Sacramento Regional WWTP is the largest wastewater discharge in the Bay Delta Estuary with an average dry design flow of 181 million gallons per day. The Sacramento Regional WWTP is the greatest source of ammonia/ammonium loading to the Bay Delta Estuary, discharging approximately 14 tons of ammonia/ammonium per day to the Sacramento River.<sup>154</sup>

## Major Ammonia NPDES Discharges in and near Delta<sup>155</sup>

Facility Name	Permit Expiration Date	NPDES Permit	Discharge Design Flow (million gallons/day)	Treatment Level Secondary (S) or Tertiary (T)	Ammonia Effluent Limit (mg/L)
Sacramento Regional Wastewater Treatment Plant (WWTP)	8/1/2005	R5-2000-0811	181	S	none
Stockton Regional Wastewater Control Facility (WWCF)	12/23/2014	R5-2008-0154	55	T	5
Central Contra Costa Sanitation District WWTP	3/31/2012	R2-2007-0008	53.8	S	none
Fairfield-Suisun WWTP	5/31/2014	R2-2009-0039	17.5	S	2
Vallejo Sanitary Flood Control District WWTP	9/30/2011	R2-2006-0056	15.5	S	none
Easterly WWTP	4/1/2013	R5-2008-0055	15	S	1.3
City of Woodland Water Pollution Control Facility (WPCF)	3/27/2009	R5-2009-0010	10.4	T	0.8
City of Manteca WPCF	10/1/2014	R5-2009-0095	9.9	T	1.4
Tracy WWTP	5/1/2014	R5-2008-0086	9	S	1.3
City of Lodi, White Slough WPCF	9/1/2012	R5-2007-0133	7	T	1.3
Mountain House WWTP	5/1/2012	R5-2007-0039	5.4	T	1
Brentwood WWTP	12/31/2012	R5-2008-0087	5	T	0.8
City of Benicia WWTP	3/1/2008	R2-2008-0014	4.5	S	35
Ironhouse Sanitary District WWTF	4/1/2013	R5-2008-0057	4.3	T	1.1
UC Davis Main WWTP	12/1/2013	R5-2008-0183	3.6	T	0.75 <sup>3</sup>
Mt. View Sanitary District WWTP	5/17/2010	R2-2006-0063	3.2	S	8
City of Galt WWTP	1/1/2009	R5-2004-0001	3	T	3.5 <sup>2</sup>
Discovery Bay WWTP	11/30/2013	R5-2008-0179	2.1	S	4.64 <sup>1</sup>

1. Effluent limit at pH 8.0, T 26 deg C with salmonids present

2. Effluent limit at pH 7.1, T 22 deg 30 day average/

3. Effluent limit seasonal 0.75 mg/L 1 May – 31 Oct, 1.11 1 Nov – 30 April.

The Central Valley RWQCB issued a draft renewal of the NPDES permit for the Sacramento RWTP that proposes changes to the existing ammonia effluent limits. The Central

Valley RWQCB recently issued a new NPDES permit to the Sacramento Regional WWTP changing the ammonia effluent limits and requiring tertiary treatment and nitrogen removal.<sup>156</sup>

The Stockton Regional WWCF discharges have an average dry design flow of 55 million gallons/day, approximately one third the size of the Sacramento RWTP. The Stockton Regional WWCF was upgraded to include treatment processes that remove ammonia because it could not meet the ammonia effluent limits established in its 2002 NPDES permit.<sup>157</sup> The upgraded Stockton Regional WWCF is operating and significantly reducing ammonia in the treated effluent.<sup>158</sup>

### **iii. Nonpoint Source Ammonia Discharges**

Potential nonpoint source discharges of total ammonia nitrogen into the Bay Delta Estuary include runoff from livestock waste, onsite waste water treatment systems (septic tanks) and runoff containing agricultural and urban fertilizer. There is limited information available about the volume of nonpoint sources of ammonia in the Bay Delta Estuary. A recent evaluation of nutrient loading to the Bay Delta Estuary by the Central Valley RWQCB suggests that the Sacramento Regional WWTP is the primary source of nitrogen to the Bay Delta Estuary downstream of the effluent discharge point from March 2009 to February 2010.<sup>159</sup> This suggests a limited contribution of total ammonia nitrogen from nonpoint sources.

### **c. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What new information is available on the sources or impacts of total ammonia nitrogen in the Bay Delta Estuary that is not reflected or cited above?
2. What information is available suggesting that site-specific water quality standards for total ammonia nitrogen in the Bay Delta Estuary may be more effective than current standards due to unique hydrological, chemical, biological, or physical conditions?
3. What information is needed to determine effective site-specific water quality standards for total ammonia nitrogen, including narrative or numeric criteria?
4. What information is available on nonpoint sources of total ammonia nitrogen and how they may most effectively and efficiently be controlled?

### 3. Selenium

#### a. Aquatic Resource Issues

Selenium is a naturally occurring element that, when mobilized in the environment and transformed to organic, bioavailable forms, is highly bioaccumulative.<sup>160</sup> Although selenium is a micronutrient, it is highly dose-sensitive and can be toxic to organisms at very low levels of chronic exposure.<sup>161</sup> Selenium toxicity in fish and wildlife reduces reproductive success through effects that lower embryo survival, such as deformed growth (teratogenesis).<sup>162</sup> In California, the damaging consequences of toxic levels of selenium first came to public attention in the 1980s when deformed waterfowl were discovered at Kesterson Reservoir in the San Joaquin Valley. Subsequent research has substantially advanced understanding of selenium sources and mobilization in the Bay Delta Estuary, the processes through which selenium enters and builds up in the ecosystem, and the effects of selenium on different species. In particular, this science points to the role of site-specific conditions, such as hydrology, geochemistry, food web, and species characteristics in determining risk to aquatic life and wildlife.<sup>163</sup> The new information raises significant questions as to whether the existing regulatory regime adequately protects aquatic life and wildlife.<sup>164</sup>

Selenium is naturally present in certain soils of marine origin and can enter the environment when precipitation introduces the selenium-bearing deposit to water. Environmental problems with selenium typically occur when large amounts are mobilized through human activities such as irrigation, mining or processing of organic fuels. Once converted to an actively bioavailable form, selenium tends to stay in a bioavailable form – a characteristic that contributes to build up in the environment over time.<sup>165</sup> Selenium has several dissolved forms (notably selenate, selenite and organo-selenide) that differ in transformation rates and bioavailability. The least bioavailable form, selenate, can be reduced by organisms to selenite and then incorporated into cells as organo-selenium.

Aquatic food webs can be particularly efficient in taking up selenium and transferring it up the food web. At the base of the food web, microorganisms such as bacteria and algae take in and assimilate selenium from ambient water. Since biotic exposure to selenium occurs through diet, rates of exposure are affected by concentrations in species' food sources. Some prey species bioaccumulate selenium more efficiently than others. For example, *Corbula amurensis*, an introduced clam that occurs from San Pablo Bay through Suisun Bay and Marsh and the central and southern Delta, accumulates selenium at roughly three times the rate of supplanted native clam species.<sup>166</sup> As a result, predator species that feed on *Corbula*, such as diving ducks (scaups and scoters) and white sturgeon, suffer high exposure to bioaccumulated selenium. In contrast to the Delta-dwelling white sturgeon, green sturgeon are more sensitive to selenium but spend less time in the Bay and Delta waters; compared to white sturgeon, green sturgeon spend more time in marine waters and also upstream of the Delta in the Sacramento River.<sup>167</sup> In addition to duration of exposure, timing of exposure relative to sensitive life stages can be a factor in impacts. For example, concerns have been expressed about the possibility that juvenile salmon, which use the Delta and San Joaquin River, might be sensitive to selenium.<sup>168</sup>



Biological variables, such as species sensitivity to selenium and preferred habitat and diet, are among the reasons that water column concentration of selenium is not in itself a reliable indicator of exposure. Differences in hydrologic conditions and associated water chemistry also affect the degree to which selenium accumulates at a given site. Where waters are relatively still and flushing is limited (lentic systems), conditions promote build-up of the more bioavailable forms of selenium such as selenite. In flowing rivers or streams (lotic systems) both the flushing function of flows and the typical form of selenium (selenates) limit uptake.

The main controllable sources of selenium in the Bay Delta Estuary are agricultural drainage (generated by irrigation of seleniferous soils in the western side of the San Joaquin basin) and discharges from North Bay refineries (in processing selenium-rich crude oil from the southern San Joaquin Basin). Both the San Joaquin River and North Bay selenium loads have declined in the last 15 years in response to, first, a control program in the San Joaquin Grasslands area, and, second, NPDES permit requirements established for refineries in the late 1990s.<sup>169</sup> The annual loads of selenium (mostly as selenate) entering the Bay Delta Estuary from the San Joaquin and Sacramento rivers vary by water year (that is, by flow), but dissolved selenium loadings averaged 2,380 kg/year from the San Joaquin and 1,630 kg/year from the Sacramento in the 1990-2007 period.<sup>170</sup> The Sacramento River selenium concentration, however, is essentially at background levels (.06 +/- .02 micrograms/L), without evidence of significant controllable sources.

Pollutant loading, transport, and residence time in the Bay Delta Estuary could change appreciably as a result of actions that are under consideration or being implemented. These actions include increases in San Joaquin River flows to restore the river and salmon runs, changes in water supply conveyance and related channel flow in the Bay Delta Estuary, and habitat restoration projects within the Bay Delta Estuary. San Joaquin River restoration or other flow augmentation programs could change the capacity of flows to mobilize and transport selenium-rich water and suspended sediments into the Bay Delta Estuary. Within the Bay Delta Estuary, exposure to selenium could increase in planned restoration habitats such as wetlands and floodplains. Thus, while the actions may have beneficial ecosystem and/or water supply objectives, there is some risk of exacerbating the impacts of selenium unless corrective measures are taken.

## **b. Regulatory Status**

### **i. Water Quality Standards**

EPA promulgated ambient water quality criteria for selenium in the Bay Delta Estuary and watershed through the National Toxics Rule (NTR) in 1992. The National Toxics Rule values are reiterated in the California Toxics Rule, issued by EPA in 2000.<sup>171</sup> Subsequently, the California Toxics Rule and Water Boards' Basin Plan amendments have established consistent values for aquatic life. The applicable chronic aquatic life criterion [5 micrograms/L chronic exposure (four day average) measured as a water column concentration] is used more frequently than the acute value.<sup>172</sup> In the Grasslands waterways and Salt Slough, a more protective chronic value of 2 micrograms/L applies in consideration of sensitive listed species. The lentic conditions of water in the marshes were also a factor in setting these site-specific objectives.<sup>173</sup>

The existing criteria for waterbodies listed in the table below, “Current Water Quality Standards,” refer to longer-term (chronic) and short-term (acute) exposure of aquatic life to selenium. The numbers represent water column concentrations of dissolved selenium and suspended particulates. All criteria listed below are set for aquatic life. The more stringent criteria in the Grasslands marshes and nearby areas are intended to protect threatened and endangered species.

### Current Water Quality Standards

LOCATION	CRITERIA		REGULATORY ACTION
	(Chronic)	(Acute)	
San Francisco Bay, including Suisun Bay and Marsh; Delta	5 microg/L – 4 day average	20 microg/L – 1 hr max	National Toxics Rule – 1992
San Joaquin River segment: Merced River to Vernalis	5 microg/L – 4 day average	12 microg/L – max instantaneous	Cent. Valley Region Basin Plan – 1996; National Toxics Rule – 1992 (chronic only)
Mud Slough; San Joaquin River segment: Sack Dam to Merced River	5 microg/L – 4 day average	20 microg/L – max instantaneous	Cent. Valley Region Basin Plan – 1996; National Toxics Rule – 1992
Grasslands marshes, Los Banos State WMA, San Luis NWR, Salt Slough	2 microg/L – monthly mean	20 microg/L – max instantaneous	Cent. Valley Region Basin Plan – 1996

The current selenium standards lack criteria specific to water-dependent wildlife,<sup>174</sup> do not account systematically for differences in the physical and chemical characteristics of waterbodies (e.g., lentic versus lotic water)<sup>175</sup> and use a measure (water column concentration, determined through dose-response tests) that is not a consistent indicator of exposure and environmental risk, because it fails to account for variables such as food web characteristics<sup>176</sup>. Water column values developed in a dose-response methodology, for example, do not take into account the relative efficiency of food webs in concentrating selenium. An ‘efficient’ food web would be one involving a selenium-sensitive species with a diet including a selenium-concentrating species (e.g., the clam, *Corbula*). Over the last decade EPA has been working with other agencies to expand the scientific knowledge of selenium and update regulatory tools.

Establishing a framework for regulating selenium that integrates protective requirements and implementation across a diverse watershed is challenging. For example, standards set to protect designated uses in lotic (flowing) systems may not protect downstream designated uses in a different environment in terms of hydrology, water chemistry, and food web relationships. Higher river flows can function to transport large, albeit dilute, loads of selenium that settle in quieter downstream locations susceptible to food web uptake. Recently presented data on concentrations of selenium in North Bay clams, which do not show a clear-cut decline in selenium despite reductions in water column concentrations in San Joaquin River water entering the Bay Delta Estuary, suggest that more information is needed to determine the relationship between river inputs and processes in the downstream environment that affect biotic uptake.<sup>177</sup>

Several efforts are underway to revise and expand standards for selenium in the Bay Delta Estuary. At the national level, EPA plans to propose Clean Water Act Section 304(a)

selenium guidance criteria for aquatic life for freshwater. The guidance criteria will include chronic values only, and will distinguish between flowing and standing waters. These guidance criteria will form the basis for adopting protective water quality standards expressed as tissue concentration of selenium in fish egg or ovary and a corresponding water column concentration, where tissue concentration data are not available. Concentrations in tissue, such as bird eggs or fish tissue, better indicate actual exposure and, in combination with food web information, provide a basis for deriving site-specific numeric water column values.

The revised national guidance criteria will be supplemented by regional efforts. EPA Region 9, in conjunction with the USGS, USFWS, and NMFS, and pursuant to its obligations under the Endangered Species Act, is developing criteria to protect threatened and endangered wildlife species, aquatic-dependent species and aquatic life in California. The first phase of this effort addresses the San Francisco Bay and Delta. It uses data on affected species and relies on the Presser-Luoma ecosystem-based model, a model that accounts for food web processes and site-specific conditions.<sup>178</sup> This phase is scheduled for completion in 2011, followed by a second phase for statewide criteria (including the San Joaquin River and its tributaries).

## **ii. TMDLs and Implementation**

North San Francisco Bay, a three-mile reach of the San Joaquin River between Mud Slough and the Merced River confluence (downstream), and the six-mile reach of Mud Slough North downstream of the San Luis Drain are each listed as impaired for selenium.<sup>179</sup> These Clean Water Act listings, which appear in the 2010 Integrated Report are based principally on evidence of ambient selenium exceeding concentration-based standards.<sup>180</sup> Reductions in selenium discharges from agriculture in the San Joaquin Basin have been a major factor in meeting water quality objectives in the San Joaquin River between the Merced and Vernalis. Based on this evidence, the State Board recently declined to list this section of the River but retained the listing for selenium impairment in the reach with lower flow between Mud Slough and the Merced River.<sup>181</sup> Delta waters are not considered impaired for selenium at the present time, largely on evidence of water column concentrations.

### ***North Bay***

Compliance with NPDES permit requirements by the oil refineries that discharge selenium in the North Bay has led to reduced loads and shifted the form of discharge towards selenate, rather than selenite.<sup>182</sup> Estimates of selenium loadings prior to improvements required in 1998 are in the range of 1700-2900 kg/year; improved wastewater treatment post-1998 has reduced loadings to an estimated 200 to 550 kg/year.<sup>183</sup> In March 2010, the San Francisco RWQCB amended four refinery permits, setting limits for total selenium, with a range from 34-50 micrograms/L maximum daily, and 33-42 micrograms/L average monthly. The limits are based on a 10:1 dilution credit, with reference to the 5 microgram/L NTR criterion.<sup>184</sup> The permit for a fifth refinery was amended in late 2009 to require similar limits.

These point sources are also incorporated into a TMDL being developed for selenium in the North Bay. The San Francisco RWQCB began work on the TMDL in 2007 and is now coordinating the schedule and completion date with the forthcoming EPA wildlife criteria and

aquatic life guidance criteria. While there are some nonpoint sources within the North Bay watersheds, the two major anthropogenic sources of North Bay selenium are the point source refineries and agricultural drainage from the San Joaquin Basin.

### ***San Joaquin Grassland Bypass Project***

The Grasslands Bypass Project, located west of the San Joaquin River and spanning the boundary between Merced County on the north and Fresno County to the south, is the current focus for implementation of selenium controls in the San Joaquin Basin. This 97,000-acre area is the northern portion of the much larger drainage problem area (730,000 acres total) described in the federal document, San Luis Unit Drainage Feature Reevaluation.<sup>185</sup> The watershed affected by the Grasslands Bypass Project encompasses both irrigated agriculture and extensive private and publicly managed wetlands. Begun in 1995, the Project is significant because it includes most of the lands that discharge subsurface drainage to the San Joaquin River and Bay Delta Estuary.<sup>186</sup>

The Grasslands Bypass Project is designed to achieve immediate protection of sensitive wetlands by routing agricultural drainage water away from this habitat into the federal San Luis Drain (a lined drainage canal) and from there into Mud Slough. Six miles downstream of this discharge point, Mud Slough enters the San Joaquin River at a reach with typically low flows. Over time, selenium load reductions implemented by the Grasslands drainers are intended to lead to fully meeting water quality objectives for all waters, including Mud Slough and the San Joaquin River.

Three TMDLs, adopted between 1999 and 2002, are being implemented through the Grasslands Bypass Project.<sup>187</sup> The regulatory framework laid out in the Basin Plan (and reinforced by conditions in a Waste Discharge Requirement) sets immediate compliance for the marshes and Salt Slough (2 ppb, monthly mean) and allows a longer period to meet existing standards for Mud Slough and the River (5 ppb, 4 day average).<sup>188</sup> Some of the implementation framework is also provided in an Agreement for use of the Drain that has been negotiated between the U.S. Bureau of Reclamation and the Delta-Mendota Water Authority.<sup>189</sup>

Implementation through drainage re-routing and reduction of selenium loads has resulted in meeting water quality objectives in the wetlands and Salt Slough and a 130 mile stretch of the San Joaquin River. Between 1996 and 2007, relying largely on control measures such as reduced water application, water conservation, and water recycling and use on salt tolerant crops, the project managers have reduced selenium loading to surface waters by approximately two-thirds.<sup>190</sup> The Project has not, however, achieved the load reductions needed to fully meet the objectives by the compliance date of October 2010 set by the Central Valley RWQCB. During the 15-year project period, the project managers have tested various technologies beyond on-site drainage management to meet selenium load-reduction targets but recently reported to the Central Valley RWQCB that full success in meeting the October 2010 date was hampered by delays in expected state funding assistance and technical difficulties with treatment technologies.<sup>191</sup> In a request to the State to extend the compliance period until 2019, the project managers expressed intent to introduce drainage treatment and disposal technologies that would result in eliminating discharges to the San Joaquin River, provided the funding and treatment

technology issues are resolved. In approving this extension, the Water Boards emphasized that the Project is subject to a prohibition of discharge in 2019. Additionally, the project managers were directed to submit a progress report by January 2013 that includes a plan for compliance with the discharge prohibition and water quality objectives, even if drainage treatment is not found to be a feasible solution.<sup>192</sup>

Controlling selenium, once mobilized, is problematic. Feasible techniques for removal from the biotic system are not evident. Various approaches to removing selenium from water have been tested since Kesterson (e.g., use of algae or bacteria to remove selenium from water, resulting in bioavailable forms that can pose a disposal problem). Currently, membrane technologies (reverse osmosis) are also being investigated.

The amount of selenium stored in the San Joaquin Basin is such that contamination in the Basin and Delta can be expected for years - possibly centuries.<sup>193</sup> Unlike contaminants that can be readily reduced by ending use, selenium is now so widely distributed through the groundwater of the west side of the San Joaquin Basin that it can continue to be a problem even with efficient agricultural irrigation and drainage activities. The situation suggests a need for sustained management and regulatory strategies, as well as a continued commitment to research and assessment.<sup>194</sup>

### **c. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What additional information is available to better characterize selenium sources, loadings and impacts within the watershed of the Bay Delta Estuary?
2. What data, studies, and analytical techniques (for example, models) could be used to improve our understanding of the physical processes, including surface-groundwater interactions, controlling selenium mobilization and transport to and within the Bay Delta Estuary?
3. What data are needed to track selenium impacts in the Bay Delta ecosystem as currently configured, and to evaluate potential impacts of selenium under changed flow and transport conditions into and within the Delta?
4. Are there additional selenium control methods or programs that should be considered for reducing selenium inputs and impacts?

## 4. Pesticides

### a. Aquatic Resource Issues

#### *General Information*

Pesticides are any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating pests. They include products such as insecticides, herbicides, fungicides, rodenticides, piscicides, and antimicrobials. Pesticides are applied indoors and outdoors to structures and landscapes, in urban, suburban and agricultural areas. They are used to control disease-causing or other harmful organisms, including rodents, insects, and weeds that threaten crops and property. Pesticides can, however, present a risk to human health and the environment because they are designed to adversely affect living organisms.<sup>195</sup>

Pesticides can cause water quality problems when they are deposited into aquatic environments where they are potentially toxic to non-target organisms. Pesticides may be transported to aquatic sites long distances from application areas by precipitation and overland flow, irrigation runoff and return flow, POTW and stormwater discharges, and atmospheric drift. The U.S. Geological Survey National Water Quality Assessment Program analyzes surface waters throughout the United States for pesticides and found that 100% of streams examined contained at least one pesticide; more than 56% of surface water samples contained one or more pesticides in concentrations exceeding aquatic-life benchmarks.<sup>196</sup>

#### *Pesticides in the Bay Delta Estuary*

More than twenty years of water quality monitoring show pesticides present in California's Central Valley waterways, including the Bay Delta Estuary, at concentrations that affect aquatic ecosystems.<sup>197</sup> The Central Valley RWQCB measured insecticides in irrigation return flows and receiving waters and established a connection between elevated pesticide levels and toxicity events in the Sacramento and San Joaquin Rivers and the Bay Delta Estuary beginning in the late 1980's. This work documented many toxicity events related to pesticide loadings including: (1) toxicity to striped bass (*Morone saxatilis*) larvae, local invertebrate (*Neomysis mercedis*) and standard test invertebrate (*Ceriodaphnia dubia*) in the Sacramento River during 1987-1990 from rice irrigation return flows;<sup>198</sup> (2) invertebrate toxicity along a 43-mile stretch of the San Joaquin River about 50% of the time between 1988 and 1990;<sup>199</sup> (3) 3-day and 12-day invertebrate toxicity events at two sampling locations within the Bay Delta Estuary in 1993 related to orchard insecticides;<sup>200</sup> (4) consistent invertebrate toxicity in the mid-1990's from insecticides in urban stormwater runoff that discharges directly to the Bay Delta Estuary from Central Valley and Bay Area Cities;<sup>201</sup> and (5) multiple diazinon toxicity events in the San Joaquin River at Vernalis, Sacramento Slough, and Orestimba Creek during January and February of 1996 and 1997.<sup>202</sup> Algal toxicity was also observed as a result of herbicides in combination with elevated copper and zinc.<sup>203</sup> More recent research documents toxic conditions for invertebrates caused by pyrethroid pesticides on a 30 km stretch of the American River, a tributary to the Sacramento River and Bay Delta Estuary, in the winter of 2009 from urban stormwater discharges.<sup>204</sup> The majority of this toxicity was attributed to bifenthrin.

Aquatic habitat designated uses are impaired in all of the Bay Delta Estuary waterways by various pesticide pollutants including: Group A pesticides (aldrin, endrin, heptachlor, heptachlor epoxide, hexachloreycyclohexane (including lindane), endosulfan, and toxaphene), chlordane, dieldrin, chlorpyrifos, diazinon, DDT, and unknown toxicity.<sup>205</sup> Tributaries upstream of the Bay Delta Estuary are also impaired for many different current-use pesticides including, but not limited to, bifenthrin, dimethoate, dacthal, malathion, diuron, simazine, trifluralin, and cis-permethrin.<sup>206</sup> In addition, pesticide investigations in the Bay Delta Estuary and upstream tributaries indicate that the source contaminant for “unknown toxicity”<sup>207</sup> most likely involves current-use pesticides, which have been detected in surface waters throughout the Bay Delta Estuary (e.g., diazinon and bifenthrin).<sup>208</sup>

Sources of pesticides to the Bay Delta Estuary include urban point source (POTW and stormwater outfalls) and agricultural nonpoint source discharges. Analysis by the Urban Pesticide Pollution Prevention project of data from the California Department of Pesticide Regulation indicate that approximately half of all California pesticide use, as measured by weight of active ingredients, occurs in urban areas.<sup>209</sup> Examples of urban pesticide use include indoor pest control and flea and tick shampoos and outdoor landscape and pest control application. In the greater Bay Delta Estuary watershed<sup>210</sup> approximately 8,430 tons (active ingredient) of 160 different pesticides<sup>211</sup> were applied in 2006 to control various agricultural and urban pest problems.<sup>212</sup> Some groups of pesticides are associated with urban usage while others are primarily agricultural. Urban stormwater, runoff, and POTWs are the primary source of pyrethroid pesticides, while agriculture remains the primary source of organophosphate (with the exception of malathion) pesticides.<sup>213</sup>

### ***Pesticides and the Bay Delta Estuary Ecosystem Collapse***

The relationship between pesticide toxicity and the long-term decline and recent plunge in pelagic fish populations is not clear.<sup>214</sup> One evaluation reported that maximum concentrations of measured pesticides were two to four orders of magnitude below established 96-hour LC50s (lethal concentration at which 50% of test organisms die) for many fish.<sup>215</sup> However, numeric water quality criteria protective of aquatic life are usually lower than the 96-hour LC50; for example, the Central Valley RWQCB considers one tenth of a well established 96-hour LC50 for the most sensitive aquatic species as the daily maximum exposure to an individual pesticide when numeric criteria and other toxicological data are not available.<sup>216</sup> In addition, exposure to multiple pesticides for time frames that exceed 96 hours, coupled with other physical stressors, may have lethal or sublethal impacts that cause or contribute to toxicity at lower concentrations than estimated 96-hour LC50, EC50s (concentration that has a specific survival effect such as impaired swimming for 50% of the test population), or lowest observed effect concentration. Larval and juvenile stages of some important pelagic species, including delta smelt, occurs in the late winter and spring overlapping with the storm season and peak concentrations of pesticides in the Bay Delta Estuary.<sup>217</sup> These exposures could result in direct acute and/or chronic toxicity to pelagic fish or an indirect effect to fish populations from toxicity to prey items.

Cellular and tissue abnormalities found in delta smelt and striped bass have been linked with insecticide exposure and reduced growth. A 3-year exposure study of delta smelt to pesticides in the Bay Delta Estuary spanning the years 1998 to 2000 shows that peak densities of

larval and juvenile delta smelt overlap with elevated concentrations of pesticides, and that delta smelt are exposed to complex pesticide mixtures for a minimum of 2-3 weeks.<sup>218</sup> Approximately 10% of delta smelt in this experiment had fragmented DNA in blood cells, an established effect of pyrethroid pesticides and other stressors.<sup>219</sup> Mixtures of pesticides measured in this study contained between 2 and 14 different pesticides at each sampling site. Striped bass researchers observed pesticides and other contaminants in striped bass eggs; brain, abdominal, and fin lesions in more than 65% of tested juveniles; and abnormal brain, liver, and overall development in river collected striped bass.<sup>220</sup>

Pesticide toxicity to prey may contribute to the long-term decline and recent drop in pelagic fish populations by limiting food availability or by contributing to fish toxicity through consumption. Some aquatic invertebrates are more vulnerable to pesticide toxicity<sup>221</sup> and make up a considerable portion of the diet for larval and juvenile pelagic fish.<sup>222</sup> Invertebrate prey items could experience toxicity during periods of peak pesticide discharges to the Bay Delta Estuary, limiting available food for larval and juvenile pelagic fish. This is consistent with observed decline in zooplankton densities in the freshwater portion of the Bay Delta Estuary.<sup>223</sup> Other stressors such as declining phytoplankton primary production and excessive nutrient loading could contribute to the zooplankton decline as well.

The two pesticide groups of recent concern and attention are organophosphates (e.g., diazinon and chlorpyrifos) and pyrethroids.<sup>224</sup> Both are insecticides, designed to kill invertebrates. Aquatic habitat designated uses are impaired in the Bay Delta Estuary due to the presence of organophosphate (OP) pesticides diazinon and chlorpyrifos.<sup>225</sup> Use of OP pesticides has been replaced in the urban market with pyrethroid pesticides.<sup>226</sup> Pyrethroids are very toxic to fish and invertebrates with 96-hour LC50s generally lower than 1 part per billion and “effect concentrations” (e.g., impaired swimming) approaching detection levels in the range of low to medium part per trillion.<sup>227</sup> There are many other pesticides of concern, including, for example, herbicides and carbamates, but they have not received the recent attention focused on pyrethroids and organophosphates.<sup>228</sup>

### ***Interaction between Multiple Stressors***

The diversity and high volume of pesticides applied in the San Francisco Bay watershed that eventually emerge in the Bay Delta Estuary raise the possibility of interactive toxicity from complex pesticide mixtures and/or pesticides interacting with other chemical, physical, or biological stressors. Interactions of greatest concern are additive and greater than additive responses. Additive responses increase toxic conditions by an amount that is approximately equal to the summation of the toxicity elicited from individual stressors. Greater than additive responses increase toxic conditions by an amount greater than the summation of the toxicity elicited from individual stressors. Additive and greater than additive relationships result in toxic responses in aquatic organisms at lower contaminant concentrations than produced by exposure to individual contaminants.

Many studies identify interactive effects between pesticides and a resulting increase in toxicity to aquatic organisms. Additive toxicity to organisms produced by exposure to binary combinations of OP insecticides,<sup>229</sup> herbicides,<sup>230</sup> and carbamate/OP pesticides<sup>231</sup> has been



demonstrated in species and pesticides that commonly occur in the Bay Delta Estuary and its tributaries. Greater than additive toxicity to aquatic organisms has also been demonstrated with OP and pyrethroid combinations<sup>232</sup> and OP and herbicide (atrazine and cyanazine) combinations that commonly occur in the Bay Delta Estuary.<sup>233</sup>

### ***Data Gaps***

Data gaps are substantial regarding pesticide use, sources, toxicity, and contribution to the Bay Delta Estuary ecosystem collapse. It is difficult to accurately estimate source contributions of land-based pesticide applications due to an incomplete record of pesticide use, inadequate water quality monitoring data and the diversity of current-use pesticides.<sup>234</sup> The California Department of Pesticide Registration collects information on pesticide use that is more detailed than required by most other states; nonetheless, an estimated 70% of pesticide use does not require reporting (e.g., home and garden use).<sup>235</sup> Information documenting the concentration of pesticides in waterways does not exist for many pesticides. One evaluation reported that less than half of the 160 different pesticides documented in the Bay Delta Estuary watershed are analyzed in water quality monitoring programs.<sup>236</sup>

Established toxicity testing using individual contaminants over four days with test organisms may not fully represent toxicity to organisms in receiving waters. Unlike organisms in laboratory toxicity testing procedures, aquatic organisms in the Bay Delta Estuary are exposed to multiple stressors including chemical (contaminants), physical (water exports, salinity, temperature, turbidity) and biological (invasive species) stressors. The Central Valley RWQCB reports that approximately 100 different pesticides have been measured in rural and urban water bodies throughout the Central Valley.<sup>237</sup> Potential interactive effects between contaminants and/or physical and biological stressors are not identified by establishing toxicity endpoints for individual pesticides in ideal laboratory conditions. In addition, observations within the Bay Delta Estuary and Central Valley tributaries illustrate that contaminant exposure times are at least four days and often much longer than the conventional 96-hour toxicity testing.<sup>238</sup> Some of these issues are addressed by research and toxicity monitoring in receiving waters and procedures for identifying pollutants responsible for toxic response.

Finally, the relative contribution of pesticide contamination to the recent collapse in pelagic fish populations and other ecosystem changes in the Bay Delta Estuary, such as the decline in zoo- and phytoplankton, is not straightforward. Research summarized above indicates that pesticide concentrations in the Bay Delta Estuary are below estimated acute toxicity thresholds for pelagic fish, but data indicating pesticides are responsible for fish abnormalities may be evidence of chronic toxicity causing population-level impacts to pelagic fish. There is evidence that ambient pesticide concentrations are acutely toxic to invertebrate prey items for pelagic fish; however, it unclear whether pelagic fish populations have declined due to food limitation. Lastly, conventional toxicity testing generally does not capture the negative impact on the aquatic ecosystem from multiple stressors present in the Bay Delta Estuary.<sup>239</sup>

## **b. Regulation under FIFRA**

Pesticide regulation under FIFRA affecting Bay Delta Estuary aquatic resources is presently dominated by ongoing litigation involving the Endangered Species Act.

In the first Endangered Species Act case, Washington Toxics Coalition v. EPA,<sup>240</sup> the plaintiffs alleged that EPA needed to consult with the NMFS over the potential effects on West Coast salmonids of registering 55 pesticides. This case covered salmonid watersheds in Washington, Oregon, and California, and included the Bay Delta Estuary and its tributary watersheds. Pursuant to a consent decree issued in 2004, EPA conducted a review of the possible effects of pesticides on these salmonids. After determining that there may be effects on 37 of the salmonid species, EPA initiated consultations with NMFS under Section 7 of the Endangered Species Act.

Given the number of species and pesticides involved, EPA and NMFS have been conducting the consultations in stages, grouping the pesticides into manageable sets. The first NMFS biological opinion under this process, which considered the widely used pesticides chlorpyrifos, diazinon, and malathion, was issued on November 18, 2008.<sup>241</sup> EPA responded to the NMFS biological opinion in its letter of September 10, 2009, outlining its proposals for restricting the use of these pesticides under FIFRA in the Bay Delta Estuary region. More recently, on May 14, 2010, EPA committed to implement revised pesticide labeling requirements for these pesticides, creating additional specific pesticide application limitations (buffers, concentrations) designed to prevent the introduction of these pesticides to waterways used by listed salmonids.<sup>242</sup>

Under the consent decree, this process of consultation will continue for each of the 37 pesticides determined by EPA to have potential adverse effects on listed salmonids. During the pendency of these consultations, application of the named pesticides is governed by a court order prescribing applications methods and watercourse setbacks.<sup>243</sup>

A second case involving pesticides in the Bay Delta Estuary is Center for Biological Diversity v. EPA,<sup>244</sup> (CBD v. EPA). In this case, the plaintiffs alleged the need for EPA to consult under the Endangered Species Act with the USFWS over the possible adverse effects on 11 listed terrestrial and aquatic species in the greater San Francisco Bay Delta area of 75 registered pesticides. These species include the delta smelt and the tidewater goby, species that inhabit the Bay Delta Estuary. The two cases involve many of the same pesticides.

On May 17, 2010, the U.S. District Court issued a stipulated injunction in CBD v. EPA. Although there are some differences, the stipulated injunction roughly followed the model of Washington Toxics Coalition. EPA agreed to conduct initial assessments of the ingredients in each of the 75 pesticides and, where potential effects to species are identified, consultation with the USFWS would be carried out. Again, given the long list of pesticides and listed species involved, the stipulated injunction breaks this process into manageable groups for evaluation.

EPA is not asking for public comment on the pesticides FIFRA litigation in this ANPR. Those two cases are active and under judicial supervision. As a part of that litigation, the public has had several opportunities to comment on the nature of the stipulated injunctions and the draft biological opinions being developed pursuant to the litigation. This information is included here to explain how EPA is addressing pesticides in the Bay Delta Estuary under one of the two major federal statutes regulating pesticides. Taken together, the evaluations and consultations being prepared under the FIFRA litigation cover both the major Endangered Species Act-listed pelagic fish and the Endangered Species Act-listed salmonids in the Bay Delta Estuary system.

### **c. Regulation under the Clean Water Act**

Pesticides fall within the scope of the Clean Water Act in addition to regulation under FIFRA. The primary areas of current interest in the Clean Water Act regulation of pesticides in the Bay Delta Estuary are (1) developing chemical specific (numeric) water quality criteria; (2) developing TMDLs for waters impaired by pesticides; (3) addressing agricultural pesticides; (4) addressing pesticides in stormwater discharges through permits; and (5) issuing a general NPDES permit for the discharge of pesticides into waters of the U.S.

#### **i. Water Quality Standards**

Water quality standards are the foundation for regulating pesticides in California under the Clean Water Act. Water quality standards, composed of water quality criteria and designated uses, for the Bay Delta Estuary are contained in three basin plans: San Francisco Bay Basin Plan (SF Bay Basin Plan), San Francisco/Sacramento-San Joaquin Delta Estuary Basin Plan (Bay Delta Estuary Basin Plan) and the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Sacramento/San Joaquin Basin Plan). The Sacramento/San Joaquin Basin Plan contains narrative water quality criteria for pesticides as a group of pollutants, numeric criteria for a few individual pesticides, and narrative toxicity criteria that are relevant when pesticides are the source of aquatic toxicity.<sup>245</sup> The SF Bay Basin Plan contains a narrative toxicity criteria, similar to the Sacramento/San Joaquin Basin Plan, but does not contain narrative or numeric criteria for pesticides as a group or for individual pesticides.<sup>246</sup> The Bay Delta Estuary Basin Plan does not contain water quality criteria that directly regulate pesticide concentrations.<sup>247</sup>

The State Board recently proposed statewide numeric toxicity criteria in its *Policy for Toxicity Assessment and Control*.<sup>248</sup> The proposed numeric toxicity criteria are expressed as statistical endpoints which represent the toxicant response that causes a given percent reduction in a biological measurement. The proposed chronic toxicity criterion establishes an unacceptable level of chronic toxicity consistent with the in-stream toxicant concentration at which 25% or more of the test organisms show adverse biological effects. The proposed acute criterion establishes an unacceptable level of acute toxicity consistent with the in-stream lethal toxicant concentration that affects 20% or more of the test organisms.<sup>249</sup>

There are seven elements in the narrative pesticide water quality criteria contained in the Sacramento/San Joaquin River Basin Plan. Four of these elements are most relevant to this

ANPR and state: (1) no individual pesticide or combination of pesticides shall be present in concentrations that adversely affect designated uses; (2) discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect designated uses; (3) pesticide concentrations shall not exceed those allowable by applicable antidegradation policies; and (4) pesticide concentrations shall not exceed the lowest levels technically and economically achievable. When numeric criteria are not adopted for individual pesticides and other information such as lowest observed effect and no observed effect concentrations for individual pesticides are not available, the Central Valley RWQC uses a figure of one tenth of the 96-hour LC50 for the most sensitive species tested as the upper limit or daily maximum for the protection of aquatic life.<sup>250</sup>

There are two numeric criteria for individual pesticides: diazinon (0.016 micrograms/L 1-day average; 0.010 micrograms/L 4-day average) and chlorpyrifos (0.025 micrograms/L 1-day average; 0.015 micrograms/L 4-day average).<sup>251</sup> The narrative toxicity criteria in the Sacramento/San Joaquin River and the SF Bay Basin Plans (under “Population and Community Ecology”) generally prohibit concentrations of toxic substances that cause acute or chronic toxicity to aquatic life.<sup>252</sup>

The Central Valley RWQCB is developing the Pesticides Basin Plan Amendment (Pesticides BPA) to address pesticide water quality impairments including interactive effects. Some objectives of the Pesticides BPA include identifying: (1) streams that should fully support aquatic life in the absence of elevated contaminant levels; (2) pesticides that present the greatest risk to aquatic life; (3) numeric metrics, including water quality criteria, that will protect aquatic life from the interactive or individual effects of high-risk pesticides; and (4) best management practices to prevent pesticide impacts.<sup>253</sup>

The Pesticides BPA is divided into two phases, with additional work on supporting studies. Completed supporting studies identify twenty eight individual pesticides as having a high overall relative risk to aquatic life, ten individual pesticides with moderate risk,<sup>254</sup> and draft numeric water quality criteria for six of the high relative risk pesticides: cyfluthrin, lambda cyhalothrin, bifenthrin, malathion, diazinon, and diuron.<sup>255</sup> Phase I of the BPA, focuses on OP pesticides diazinon and chlorpyrifos, will include proposed water quality criteria and TMDLs for diazinon and chlorpyrifos-impaired waterbodies. A draft staff report for Phase I is anticipated in late 2010. Phase II will focus on developing numeric water quality criteria and TMDL development for pyrethroid and other high-risk pesticides, and is scheduled to be completed in late 2012.<sup>256</sup>

## **ii. TMDLs**

The Central Valley RWQCB adopts TMDLs to address water quality impairments. The 2010 Clean Water Act 305(b) and 303(d) Integrated Report for California (2010 Clean Water Act 303(d) List) recently adopted by the State Board identifies violations of state water quality standards as a result of pesticide concentrations exceeding narrative and numeric criteria causing impairments to aquatic habitat designated uses in all Bay Delta Estuary Waterways.<sup>257</sup> The Central Valley RWQCB adopted TMDLs and TMDL implementation plans addressing organophosphate pesticides in the Bay Delta Estuary and upstream watersheds and is developing

an organochlorine TMDL for the Central Valley. These TMDLs are designed to reduce pesticide concentrations in the Bay Delta Estuary and its upstream tributaries with the goal of attaining water quality standards.

The draft organochlorine pesticides TMDL addresses legacy pesticides whose registrations were cancelled by EPA in the 1970's. This persistent class of contaminants is still detected in water, sediment, and biological tissue at levels high enough to warrant listing Bay Delta Estuary and Central Valley tributaries on the 2010 Clean Water Act 303(d) List of Impaired Water Bodies. Organochlorine pesticides include (but are not limited to) dichlorodiphenyltrichloroethane (DDT), aldrin, endrin, heptachlor, hexachloreycyclohexane, and endosulfan (still in use but being phased out). The proposed TMDL includes numeric targets for the water column, sediment, and fish tissue derived from the existing narrative criteria.<sup>258</sup>

The Central Valley RWQCB has adopted TMDLs and TMDL implementation plans for diazinon and chlorpyrifos in the Sacramento and Feather Rivers, Sacramento County urban creeks, San Joaquin River, and the Sacramento-San Joaquin Delta (Bay Delta Estuary) waterways. The diazinon and chlorpyrifos TMDLs for these waterways include wasteload allocations for point sources and load allocations for non-point sources that address the additive toxicity of diazinon and chlorpyrifos. Point sources are addressed by implementing effluent limitations in NPDES permits. Agricultural pesticide sources are partially addressed through the Central Valley RWQCB Irrigated Lands Regulatory Program and its Conditional Waiver of Waste Discharge Requirements (waiver). The waiver of waste discharge is a permit that authorizes the discharge of pollutants into waterways from irrigated lands when specific conditions are met, including achievement of water quality standards in receiving waters, and monitoring and reporting.<sup>259</sup>

### **iii. Regulation of Agricultural Discharge**

The Central Valley RWQCB Irrigated Lands Regulatory Program (ILRP) is part of a unique regulatory framework in California that addresses pesticide water pollution. The Central Valley RWQCB has been addressing agricultural pesticide discharges into the Central Valley and Bay Delta Estuary waters since the early 1980s through Waivers of Waste Discharge Requirements issued under the Porter-Cologne Water Quality Control Act and California Water Code. In 2003, the Central Valley RWQCB adopted a Conditional Waiver of Waste Discharge Requirements for Irrigated Lands (renewed in 2006) and directed staff to develop environmental documentation for a long-term Irrigated Lands Regulatory Program.<sup>260</sup>

The Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands is a general permit that waives the requirement for an individual permit for entities that join a "coalition group." Coalition groups conduct water quality monitoring to determine the effect of member discharges on water quality. If specific water quality problems are identified in the monitoring reports, coalition groups create management plans and coordinate with members to implement best management practices that reduce pesticides or other contaminant loadings to waters.<sup>261</sup> The current Irrigated Lands WDR waiver for irrigated lands in the Central Valley will expire in June 2011. It may be renewed or Central

Valley RWQCB may transition to implementation through the proposed long-term Irrigated Lands Regulatory Program (ILRP).

The Central Valley RWQCB released a draft programmatic Environmental Impact Report (PEIR) for the proposed long-term Irrigated Lands Regulatory Program in July 2010 for public comment. The overall goals of the long-term ILRP are to (1) restore and/or maintain the highest reasonable quality of state waters considering all the demands being placed on the water; (2) minimize waste discharge from irrigated agricultural lands that could degrade the quality of state waters; (3) maintain the economic viability of agriculture in California's Central Valley; and (4) ensure that irrigated agricultural discharges do not impair access by Central Valley communities and residents to safe and reliable drinking water.<sup>262</sup> The Final EIR and Central Valley RWQCB action is planned for 2011.<sup>263</sup>

#### **iv. Stormwater Permits**

Stormwater discharges from MS4s, associated with construction activity, and associated with industrial activity have been shown to carry pesticides to surface waters and affect water quality.<sup>264</sup> The current NPDES permits for these stormwater discharges, to some degree, address the issue of pesticides in stormwater discharges, in addition to other pollutants.

In California, stormwater discharge permits are issued by the Water Boards under the authority of the Clean Water Act. There are six individual MS4 stormwater permits potentially affecting the Bay Delta Estuary, as well as a statewide general permit for smaller dischargers.<sup>265</sup> Much of the area surrounding the Bay Delta Estuary is covered by one of these stormwater permits.

The MS4 permit for the Sacramento County and associated cities requires permittees to implement a Pesticide Plan approved by the Central Valley RWQCB (Provision D.27.a Pesticides). The plan addresses the permittees use of pesticides including diazinon, chlorpyrifos, and other lower priority pesticides. The permit requires implementation of Integrated Pest Management practices, public education and outreach, and studies of the local or regional sales and use of residential and commercial pest control products potentially found in stormwater runoff.

The California Construction General Permit (CA CGP)<sup>266</sup> was issued by the State Board on September 2, 2009 and expires in 2014. The CA CGP requires that stormwater discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective. The CA CGP requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in stormwater. Of significant concern for stormwater discharges associated with construction activity are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, in particular glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with stormwater.

On December 1, 2009, EPA promulgated the final Construction and Development Effluent Limitations Guideline and Standards (C&D ELG) which in relevant part stated that construction site operators must “[d]esign, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to...[m]inimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, *pesticides*, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater.”<sup>267</sup> Any new or reissued NPDES permit for stormwater discharges associated with construction activity in California must incorporate the applicable requirements in the C&D ELG.<sup>268</sup>

The California Industrial Stormwater General Permit<sup>269</sup> (CA IGP) was issued by the State Board in 1997. The State Board noticed a draft reissuance of the Industrial Stormwater General Permit in 2005; however no final action has been taken on the reissuance. The current permit requires that operators reduce or prevent pollutants in stormwater discharges associated with industrial activity and ensure that such discharges will not cause or contribute to an exceedance of any applicable water quality standards. Additionally, the CA IGP addresses stormwater and non-stormwater coming into contact with “significant materials” on industrial sites, defined in the permit to include pesticides.

The stormwater permit programs described above may not cover all stormwater discharges of concern. If EPA or California finds that other currently unregulated stormwater discharges are contributing pollutants to waters of the U.S. or contributing to water quality standards exceedances, EPA and/or California may require those discharges to obtain NPDES permits through “residual designation.”<sup>270</sup> Examples of these currently unregulated point source discharges of stormwater include small MS4s currently outside urbanized areas that may not meet the population threshold for a regulated small MS4 and stormwater discharges from impervious surfaces, such as commercial facilities, retail centers, or residential subdivisions.

As part of its implementation of the Phase I and II stormwater regulations, California has used its authority under 40 C.F.R. 122.35 to designate unregulated small MS4s as requiring NPDES permit coverage.<sup>271</sup> EPA and/or California may designate additional discharges from unregulated MS4s to surface waters in the Bay Delta or its tributaries as necessary in order to address the impacts of pesticides on the water quality of the Bay Delta Estuary.

Alternatively, instead of designating discharges from MS4s, EPA and/or California may designate individual or categories of stormwater discharges for regulation under the Clean Water Act. For example, EPA Region 1 (New England) is in the process of using the residual designation authority under 40 C.F.R. 122.26(a)(9)(i), to designate and require an NPDES permit for stormwater discharges from two or more acres of impervious surface in the Charles River watershed in Massachusetts. While the Charles River residual designation and proposed NPDES permit are not focused exclusively on the discharges of pesticides, a byproduct of regulating stormwater discharges from developed sites will be a reduction in various pollutants, including pesticides, discharged to surface waters. The Region 1 proposed permit includes a provision for the proper management of landscaped areas in the watershed that includes the requirement to “minimize the risk that any landscaped pervious surfaces will contribute pollutants to stormwater

discharges from the [site]...[a]t a minimum, this shall include assuring the proper storage, use, and disposal of fertilizers, *pesticides*, and herbicides....”<sup>272</sup> To date, the residual designation approach has not been proposed or used in the Bay Delta Estuary.

Another approach to addressing stormwater discharges is being undertaken by EPA Region 3 and the EPA Office of Water in the Chesapeake Bay watershed.<sup>273</sup> In a nationwide effort to revise EPA’s stormwater regulations,<sup>274</sup> EPA may propose revisions to the existing MS4 regulations for stormwater discharges from MS4s under Clean Water Act Sections 402(p)(3)-(4) and (p)(6) and/or the designation and regulation of stormwater discharges from developed sites under Clean Water Act Section 402(p)(6). As part of any national rule, EPA is considering designating stormwater discharges from newly developed and redeveloped sites to protect water quality; revising the scope of regulated MS4 discharges subject to NPDES permitting; addressing discharges from existing development (e.g. to address existing impairments in receiving waters). EPA is considering Chesapeake Bay-specific provisions, such as expanding the regulatory coverage to a greater number of discharges than required under any national stormwater rule. This includes the consideration of Chesapeake Bay-specific requirements that may be needed to meet the TMDL wasteload allocations. While this Region 3 and EPA Office of Water effort is not focused exclusively on the discharges of pesticides, regulating stormwater discharges from developed and redeveloped sites and revising the requirements in MS4 permits will likely reduce multiple pollutants, including pesticides.

#### **v. General NPDES Permits for Aquatic Pesticide Application**

On March 12, 2001, the Ninth Circuit Court of Appeals, in Headwaters, Inc. v. Talent Irrigation District,<sup>275</sup> held that discharges of pollutants from the use of aquatic pesticides to waters of the United States require coverage under a Clean Water Act NPDES permit. As a result, in 2004, the State Board issued general permits for the discharge of aquatic pesticides to surface waters for vector control<sup>276</sup> and weed control.<sup>277</sup>

In 2006, EPA promulgated a final rule (Pesticides Rule) that exempted FIFRA-compliant pesticide application from needing an NPDES permit for: (1) the application of pesticides directly to water to control pests; and (2) the application of pesticides to control pests that are present over or near water, where a portion of the pesticides will unavoidably be deposited to the water to target the pests.<sup>278</sup> On January 9, 2009 the Sixth Circuit Court of Appeals, in National Cotton Council of America v. EPA,<sup>279</sup> (National Cotton), vacated EPA’s 2006 Pesticides Rule holding that the Clean Water Act unambiguously includes “biological pesticides” and “chemical pesticides” with residuals within its definition of “pollutant.” The Sixth Circuit granted a two-year stay of its mandate; however, by April 2011, NPDES permits will be required nationwide for discharges of pesticides to waters of the U.S.

In response to the National Cotton decision, EPA has proposed a Pesticides General Permit (PGP) to cover discharges of pesticides to waters of the U.S.<sup>280</sup> While the National Cotton decision applies nationally, the PGP will not apply in California since EPA is not the NPDES permitting authority for the State of California. The vector control and weed control general permits promulgated by the State Board in 2004 are the current permits applicable to pesticide application in California including the Bay Delta Estuary, as they were unchanged in



response to EPA's 2006 Pesticides Rule. Additionally, the State Board has released a preliminary draft general permit for adulticide to cover the discharge of residual pesticides to waters of the U.S. resulting from adult mosquito spray applications.<sup>281</sup> Thus, in the Bay Delta Estuary, the application of pesticides directly to, over, or near, water may require permit coverage under either the state's vector control general permit, the state's weed control general permit, or the adulticide general permit that is currently being proposed by the State Board.

#### **d. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What additional scientific information is available on (a) the effects of pesticides in stormwaters discharges, or (b) the potential interactive effects of combinations of pesticides on aquatic resources in the Bay Delta Estuary?
2. What actions should EPA take under its authority to improve the effectiveness of regulating pesticide contamination of the Bay Delta Estuary watershed?
3. How can the process for establishing numeric water quality criteria be streamlined while maintaining technical integrity?
4. What are the benefits and constraints of using fish tissue in place of or in addition to water column concentrations when establishing water quality criteria for pesticides?
5. Are there testing protocols that would effectively and efficiently identify synergistic toxic effects in the Bay Delta Estuary?
6. What, if any, specific combinations of contaminants are of particular concern in the Bay Delta Estuary?
7. Should EPA and our state partners move away from evaluating isolated aquatic species for one or two pollutants, and towards evaluations of water conditions more representative of the actual aquatic conditions in the Bay Delta Estuary? How might this be done?

8. What water quality benefits would result from revising and/or requiring effluent limitations, monitoring requirements or other permit requirements in NPDES permits for discharges from MS4s in the Bay Delta Estuary that are established at levels intended to reduce the discharge of pesticides to the maximum extent practicable? What information is necessary to determine permit requirements, such as identifying effluent limits that can effectively reduce ambient contaminant concentrations and restore designated uses?

9. What water quality benefits would result from revising and/or requiring effluent limitations, monitoring requirements or other permit requirements in NPDES permits for stormwater discharges associated with construction activity and/or stormwater discharges associated with industrial activity to address pesticides? What information is necessary to determine permit requirements, such as identifying effluent limits that can effectively reduce ambient contaminant concentrations and restore designated uses?

10. Would water quality benefits occur if EPA used its residual designation authority at 40 C.F.R. 122.35 to designate currently unregulated small MS4s to ensure that municipalities have programs in place to control the discharge of pesticides in stormwater to the maximum extent practicable? What information is necessary to determine permit requirements, such as identifying effluent limits that can effectively reduce ambient contaminant concentrations and restore designated uses?

11. What water quality benefits would occur if EPA used its residual designation authority at 40 C.F.R. 122.26(a)(9)(i)(C)-(D) to designate currently unregulated stormwater discharges that contribute pesticides to surface waters? What information is necessary to determine permit requirements, such as identifying effluent limits that can effectively reduce ambient contaminant concentrations and restore designated uses?

## **5. Contaminants of Emerging Concern**

### **a. Aquatic Resource Issues**

Nationally, researchers are documenting potentially significant effects on aquatic ecosystems from compounds that have not traditionally been considered or regulated. These “contaminants of emerging concern” (CECs) include pharmaceuticals, personal care products, solvent stabilizers, flame retardants, pesticides and other commonly used commercial and industrial compounds. These substances can be introduced into the aquatic environment through a variety of sources including municipal and industrial wastewater systems, urban stormwater, animal husbandry operations and agricultural runoff.

Some of these substances may be endocrine disrupting chemicals (EDCs), which are exogenous substances that change endocrine function and cause adverse effects at the level of the organism, its offspring, and/or (sub)populations of organisms. EDCs can alter hormone levels, potentially resulting in the masculinization of female mollusks,<sup>282</sup> the feminization of male fish, and reproductive effects.<sup>283</sup> Of the CECs detected in surface waters of the U.S., EDCs have

received the most attention because field studies have shown that very low concentrations of some of these compounds can significantly affect natural populations of aquatic vertebrates.

In San Francisco Bay (downstream of the Delta), the Bay Regional Monitoring Program began collecting data on CECs since 2001 and has generated a relatively extensive dataset for CECs in the Bay, with a few sampling locations in the Delta.<sup>284</sup> A few pilot studies have collected data in the Delta and upstream tributaries but there are significant data gaps. Very few CECs are routinely monitored in the environment. Some Regional Water Boards have begun to include permit conditions for major POTWs to conduct special studies, technical reports and additional monitoring for CECs in their effluent.

Although there is not sufficient data in the published literature to adequately assess the ecological implications of CECs in the Bay Delta Estuary,<sup>285</sup> there is ample evidence that to warrant additional attention. Compounds that may be EDCs have been found in waters of the Central Valley and at particularly high levels in the Delta and Napa River.<sup>286</sup> In addition, endocrine disrupting effects, such as skewed sex ratios in a population and developmental disruptions in individuals, have been found in fishes of the Delta.<sup>287</sup> One researcher showed that sex ratios in adult striped bass were skewed toward males to the extent that the altered sex ratio might account for the near absence of young fish in recent years.<sup>288</sup> Many more male than female silversides (*Menidia beryllina*) were found at an urban sampling site compared to an agricultural site in Suisun Marsh. This study also measured the effects of potential EDCs in the water from these sites on sensitive cell lines and found estrogenic activity at both sites, but significantly higher androgenic activity at the urban site.<sup>289</sup> Evidence of low frequency endocrine disruption was found in 2005 in adult delta smelt collected in the Delta and Suisun Marsh. In this study, 9 of 144 (6%) of adult delta smelt males were intersex, having immature oocytes in their testes.<sup>290</sup>

Like other contaminants, CECs exist in the environment in mixtures. Some studies (not in the Delta) have begun to look at interactive effects though much more research is needed to draw meaningful conclusions.

## **b. Regulatory Status**

On a national level, EPA's strategy for addressing the effects of CECs includes improving science and public understanding; identifying partnership and stewardship opportunities; and taking regulatory action when appropriate.<sup>291</sup>

There are currently no water quality aquatic life criteria or drinking water standards, making data difficult to interpret.<sup>292</sup> EPA is evaluating the potential impacts of CECs on aquatic life and developing an approach for determining protective levels for aquatic organisms. EPA uses guidelines established in 1985 to derive ambient water quality criteria (AWQC) for aquatic life.<sup>293</sup> These guidelines consider acute effects (short-term effects such as survival) and chronic effects (longer-term effects such as reproduction) for traditional pollutants. Developing aquatic life criteria for CECs and potential EDCs may require modified methodologies along with effects endpoints not previously evaluated using the 1985 guidelines. For instance, potential EDCs may demonstrate low acute toxicity but cause reproductive effects at very low levels of chronic

exposure. In addition, the effects of exposure on aquatic organisms during the early stages of life may not be observed until adulthood. Therefore, traditional toxicity test endpoints may not be sufficient for criteria derivation for these chemicals and the chemicals may also have specific modes of action that may affect only certain types of aquatic animals (e.g., vertebrates such as fish).

In response to this challenge, in June 2008, EPA developed a white paper detailing technical issues and recommendations to serve as a basis for modifying the 1985 guidelines to better address CECs and develop AWQC protective of aquatic life.<sup>294</sup> This paper was reviewed by EPA's Science Advisory Board.<sup>295</sup> The SAB supports development of risk-based aquatic life criteria for EDCs which include consideration of probable direct and/or indirect impacts on food webs, ecological processes and services, and endangered or unique species of special value or concern. In addition, the SAB noted the potential for interactive effects that may occur in CEC mixtures in the environment and which may also interact with environmental variables such as temperature.

EPA has developed new analytical test methods for particular CECs, although much such work remains to be done. Since the first reports that CECs were occurring in surface waters, questions have been raised regarding their presence in sewage influent, effluent and sludge. At the time of these first reports, no suitable analytical methods were available for these waste streams. EPA has developed two new analytical methods to identify and measure certain CECs, specifically, pharmaceuticals, steroids and hormones in sewage influent, effluent and sludge. These methods currently cover over 100 chemicals (74 pharmaceuticals and personal care products and 27 steroids-hormones) and three wastewater matrices (raw and treated sewage water and sludge). EPA has also revised the flame retardants (PBDE) analytical method. The contaminants in these methods are not currently regulated, nor have the methods been promulgated at 40 C.F.R. Part 136.<sup>296</sup>

In California, a workshop in 2009 brought together scientists, water quality managers, and stakeholders to initiate an effective CEC management strategy. Consensus was reached around certain findings and recommendations, including: (1) the current chemical-specific risk assessment approach is neither feasible nor cost-effective for prioritizing and managing the vast majority of CECs; (2) developing regulatory limits is premature given the state of knowledge; (3) flexible, multi-element prioritization framework is needed to identify compounds of highest concern; (4) a single master list of CECs that agencies could apply effectively across all applications is unlikely; (5) the interpretation of monitoring data and subsequent decision-making should be based on tiered, multiple thresholds; and (6) an adaptive management strategy is imperative to respond to rapidly changing knowledge.<sup>297</sup>

The "Policy for Water Quality Control for Recycled Water" adopted by the State Board in February 2009 included mandated monitoring of CECs in municipal recycled water.<sup>298</sup> To provide guidance on implementing this aspect of the policy, the State Board tasked the Southern California Coastal Water Research Program (SCCWRP) with convening a Science Advisory Panel. The recommendations from that panel<sup>299</sup> are under consideration by the State Board.<sup>300</sup> SCCWRP is convening another scientific panel to advise the State on how best to limit the impact of CECs on oceans, estuaries and wetlands.<sup>301</sup>

### **c. Voluntary Activities**

Federal, state and local agencies have experimented with voluntary source control efforts, such as “take-back” programs and events, which are collection methods aimed at reducing the quantity of unused pharmaceuticals entering the environment. Some communities have ongoing pharmaceutical take-back programs or community solid waste programs that allow the public to bring unused drugs to a central location for more appropriate disposal. In 2009, EPA partnered with the California Pharmacists Association, EBMUD, CASA, TriTac, and others on the No Drugs Down the Drain campaign.

On October 12, 2010, President Obama signed the Secure and Responsible Drug Disposal Act of 2010. The bill establishes programs to safely dispose of unused or unwanted prescription drugs and controlled substances through community-based efforts, amends the Controlled Substance Act to allow the attorney general to develop drug disposal programs, and allows long-term care facilities to dispose of drugs on behalf of their residents.

In September 2010, EPA issued a draft guidance document, "Best Management Practices for Unused Pharmaceuticals at Health Care Facilities" for hospitals, medical clinics, doctors' offices, and long-term care facilities. It describes techniques for reducing or avoiding pharmaceutical waste, practices for identifying and managing unused pharmaceuticals, and applicable disposal regulations. EPA is revising the document based on public comment.

### **d. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What additional information suggests that CECs may be affecting aquatic resources in the Bay Delta Estuary?
2. What specific information exists to identify the sources and nature of discharges of CECs into the Bay Delta Estuary?
3. What monitoring mechanisms or methodologies are available to assist in identifying CECs?
4. What methods are most effective to minimize introduction of CECs into the Bay Delta Estuary?

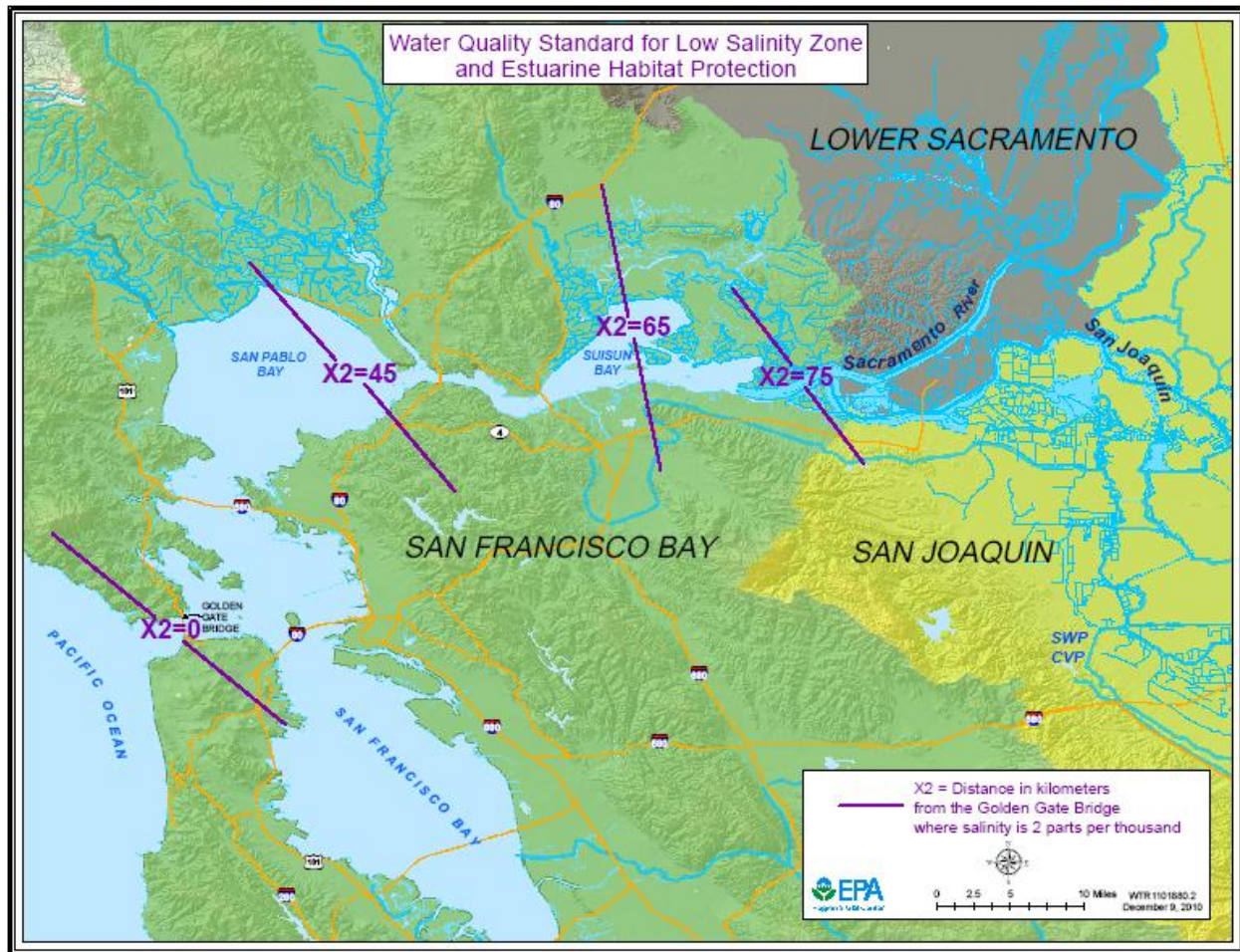


Figure C. Low Salinity Zone (X2) in the Bay Delta Estuary

## B. Protecting Estuarine Habitat, Fish Migratory Corridors and Wetlands

### 1. Estuarine Habitat

#### a. Aquatic Resource Issues

For many species of fish and invertebrates in San Francisco Bay, ocean conditions and broad climatic changes drive population abundance, but estuarine species of Suisun Bay and the Delta are controlled by other factors.<sup>302</sup> A number of factors are apparently important for the health of estuarine species, but the location of the low salinity zone (X2<sup>303</sup>) plays a large role, both historically<sup>304</sup> and recently.<sup>305</sup> The low salinity zone is the location of the greatest abundance of many pelagic organisms of the upper Bay Delta Estuary,<sup>306</sup> including the threatened delta smelt (*Hypomesus transpacificus*), the state-listed longfin smelt (*Spirinchus thaleichthys*) and juvenile striped bass (*Morone saxatilis*), the former premier sport fish of the Bay Delta Estuary. The average springtime location of the low salinity zone (X2) is also tied to the survival or abundance of a number of fish and larger invertebrates of the Bay Delta Estuary.<sup>307</sup> The nature of the low salinity zone is also important for less desirable species. For one major invasive species, the overbite clam (*Corbula amurensis*) salinity variability is an important determinant of their distribution and impact.<sup>308</sup> Given these correlations, X2 is an

effective indicator of ecosystem conditions from year to year.<sup>309</sup> The community-level, rather than species-specific, nature of X2 makes it uniquely suitable as a broad estuarine habitat protection standard.<sup>310</sup> Climate change and associated sea-level rise are expected to make salinity distribution in the Bay Delta Estuary an even more important ecological driver than at present.<sup>311</sup>

Recent research suggests that the quantity and quality of low salinity estuarine habitat, as measured by the location of the 2 ppt salinity gradient or X2, has declined during the fall period since 1985.<sup>312</sup> As shown in Figure , the low salinity zone in the fall has moved upstream, especially after 2000. When the low salinity zone moves upstream, its areal extent shrinks as the low salinity zone is forced into the narrow, deeper channels of the interior Delta and away from the broad shallow shoals of Honker Bay and Suisun Bay downstream. Figure reflects this correlation between the location of the low salinity zone and its areal extent. In the late 1990s, the median areal extent of this low salinity estuarine habitat was about 9000 hectares in the fall; since 2000, that habitat declined by about 78 percent.

Figure also shows the dramatic decline in the variability of the location (and therefore the extent) of low salinity habitat. Prior to 2000, the location of the low salinity zone during the fall varied significantly from year to year, based on springtime precipitation and releases from summertime carryover reservoir storage. The areal extent of low salinity habitat for smelt and striped bass in the fall thus also varied from year to year.

Since 2000, the low salinity zone in the months of September through November (fall X2) has been consistently further upstream in the watershed in all water year types,<sup>313</sup> in the western Delta (rather than fluctuating between the western delta and further west into Suisun Bay). This consistent upstream shift of the low salinity zone has greatly reduced areal extent of the fall habitats of delta smelt and young striped bass. This change in the fall X2 has also been associated both with increased upstream abundance of invasive clams<sup>314</sup> and jellyfish<sup>315</sup> and with declines in abundance of young striped bass and pre-spawning delta smelt.<sup>316</sup> The combined indicators of adult delta smelt abundance and the location and extent of fall habitat appear to be a good predictor of subsequent summer delta smelt abundance.<sup>317</sup>

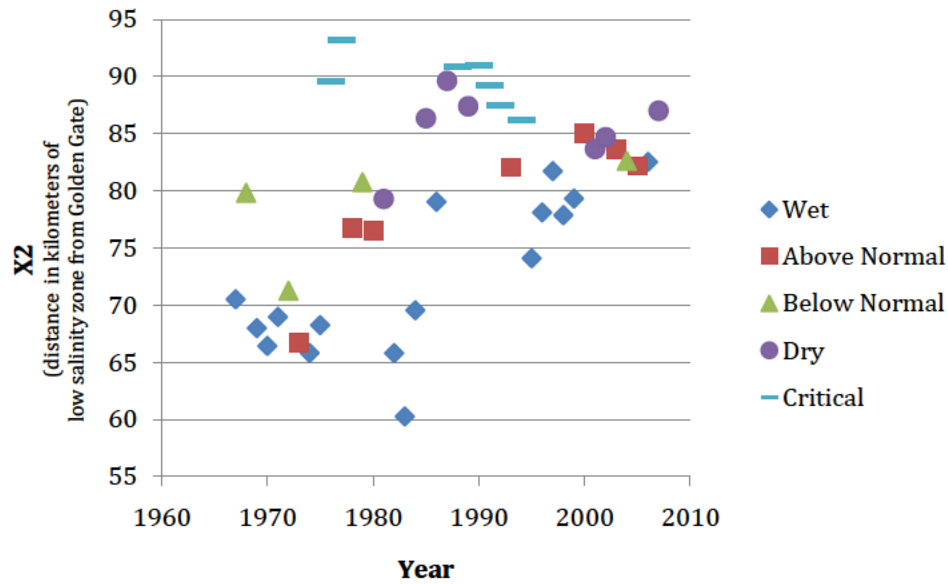


Figure D. Fall Location of Low Salinity Zone (X2) 1960-2010, by water year<sup>318</sup>

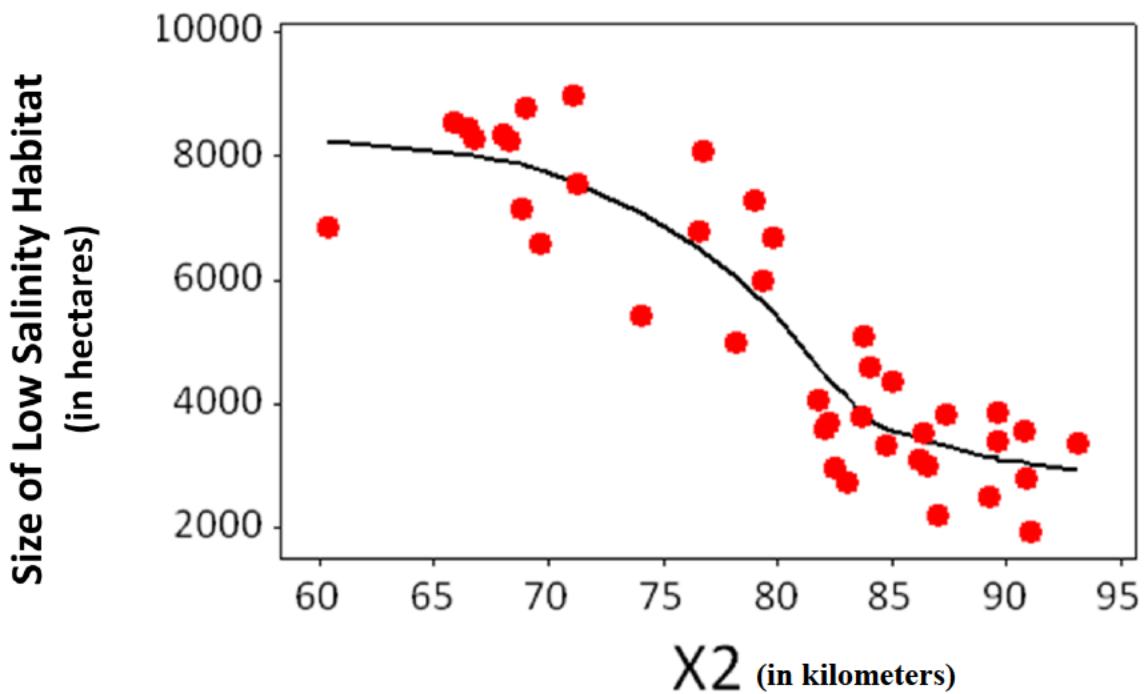


Figure E. Habitat Size based on Fall Location of Low Salinity Zone (X2)

## b. Regulatory Status

The State Board's Water Quality Control Plan has included "estuarine habitat" as a designated use since 1989. Pursuant to the Clean Water Act, EPA reviews a state's water quality standards to determine whether the state has adopted criteria that protect the designated water uses.<sup>319</sup> In the past, this review has included a consideration of physical, chemical, and



biological parameters such as temperature and salinity.<sup>320</sup> In 1995, the State Board adopted outflow requirements during the spring to protect the estuarine habitat designated use. These outflow requirements were based on the X2 concept and reflected several years of discussion and refinement in a collaborative effort between regulatory agencies and interested water exporter and environmental organizations. When adopted, the X2 standard was widely praised as a broad ecosystem standard that provided protection for estuarine species generally, as opposed to the individual species orientation of other regulatory measures.<sup>321</sup> Although the degree of correlation between X2 and abundance has shifted somewhat for some species since 1994, analyses show that X2 remains an important factor affecting the suite of species that have declined since 2000.<sup>322</sup>

The X2 standard, adopted by the State Board and approved by EPA in 1995 and restated in 2006, applies only in the spring months (February - June). During these months, most young salmonids are migrating downstream and most resident estuarine fishes are spawning. Correlations of X2 with species abundance or survival, upon which the standard was based, were highest for spring months. In many years springtime conditions in the Delta are driven by high precipitation and flood control activities rather than export operations. The 1995 Water Quality Control Plan was influenced by concerns raised during the 1987-92 drought, when springtime conditions were exceptionally more adverse than in preceding years. Most of the fish now listed under the Endangered Species Act were listed in the years immediately following the 1987-92 drought.

After adoption of the 1995 Water Quality Control Plan and the return of more normal springtime flows, most species of interest showed a resurgence in abundance. Delta smelt almost achieved the criteria for delisting identified in their Endangered Species Act recovery plan,<sup>323</sup> adult striped bass populations returned to levels not seen since the 1970s, threadfin shad were sharply rising in abundance and longfin smelt were achieving fairly high abundances.<sup>324</sup> Around the year 2000, however, the well-sampled pelagic fishes all simultaneously declined.<sup>325</sup> At the time of this decline, the location of the low salinity zone moved upstream during fall months of all years and was greatly reduced in areal extent. This change in habitat, and the proposed project operations to maintain these conditions into the future, was identified as a threat to the survival of delta smelt and as a degradation of its critical habitat.<sup>326</sup> Consequently, the 2008 USFWS Biological Opinion on the impact of SWP and CVP operations on delta smelt included a provision to manage low salinity zone habitat in the fall.<sup>327</sup> That provision mandates specific fall X2 values, and the associated areas of suitable habitat, during fall months after wet and above-normal water years.<sup>328</sup> This fall X2 provision restores some of the fall habitat that characterized the Bay Delta Estuary until 2000.<sup>329</sup>

The fall X2 requirement in the 2008 Delta Smelt Biological Opinion has been reviewed in two independent peer review processes.<sup>330</sup> Both reviews supported the importance of habitat protection and the suitability of using X2 as a surrogate for that habitat. At the same time, both reviews also questioned the basis for the exact targets specified in the Opinion and supported the requirement for intensive study and monitoring of the effects of the requirement. The NAS review also questioned the predictive nature of the relationship for delta smelt abundance.<sup>331</sup>

The State Board included the fall X2 flow prescriptions of the USFWS Biological Opinion for delta smelt in its recommendation for flows needed to broadly protect public trust resources, but did not recommend greater flows until the values of the Biological Opinion flows were analyzed and potential risks to cold water habitat for salmon spawning were avoided.<sup>332</sup> Likewise, the California Department of Fish and Game recommended maintaining X2 between 74 km and 81 km between September and November in wet and above normal years, but did not recommend greater flows unless studies show they will not compete with preservation of cold water pool resources needed for the protection of winter-run salmon.<sup>333</sup>

c. Request for Public Comment

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What information is available on the effect of lower salinities in the western Delta on undesirable species such as *Microsystis*, overbite clams, or jellyfish? What information is available to determine if greater flows required to increase low salinity habitat would affect the fate, concentration and distribution of nutrients and toxics that are potentially negatively affecting the estuarine food web?
2. What frequency, increase in area, and/or duration of low salinity habitat is required to achieve ecosystem benefits for the suite of species that use the low salinity zone? Is historical data on inter- or intra- annual frequency of variability the best basis for setting goals or are there other bases that could be used? How might climate change impacts, including sea level rise, affect the size, frequency, and duration of low salinity habitat?
3. Are methods available for more systematically addressing ecological or biological connections between springtime X2 and subsequent fall X2 conditions?
4. Under what conditions would changes in system operations to move X2 seaward in the fall adversely affect the reservoir storage needed to conserve salmonid fish spawning and other designated uses in the watershed?
5. What information is available on the effects of salinity management on terrestrial plant communities and/or tidal marsh endemic species? What indirect effects does this have on the aquatic communities?
6. What is the effect of the geographic location of low-salinity habitat on the quality of the habitat or its availability to species of concern? Is the distribution pattern of low salinity habitat important in determining its quality?

7. Spring/neap differences in tidal water quality are important but frequently ignored. How will these habitat characteristics be evaluated?

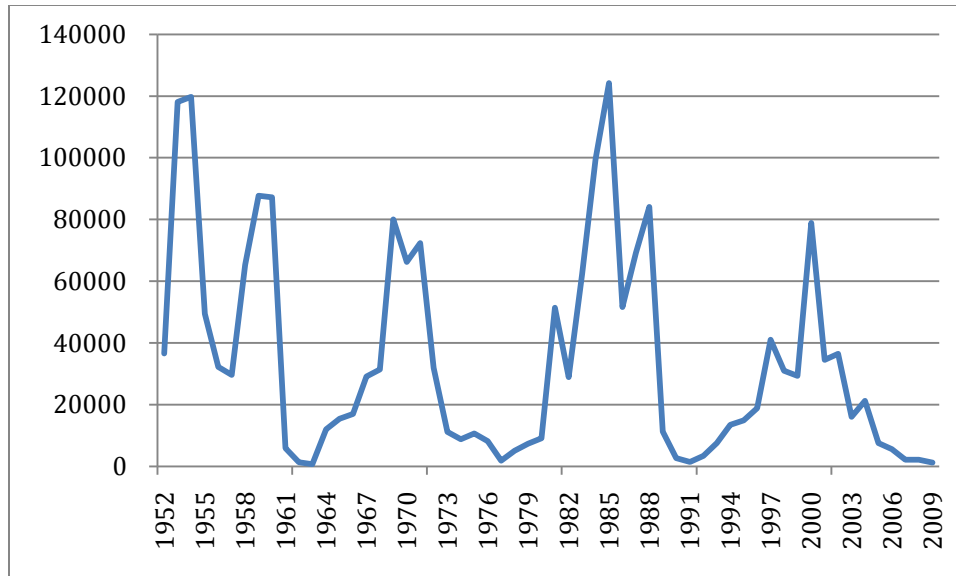
8. How can performance measures for species population and/or habitat condition be used to evaluate restoration of Bay Delta Estuary water quality?

## **2. Migratory Fish Corridors**

### **a. Aquatic Resource Issues**

San Joaquin Valley salmonid populations have suffered a long-term decline. Spring-run salmon that spawned on the upper San Joaquin were eliminated after the construction in the 1940's of the Central Valley Project's Friant Dam on the San Joaquin River near Fresno and the Mendota and Friant-Kern Canals. On average, over 90% of the San Joaquin River flow at Friant Dam has been diverted annually, resulting in dewatering of several reaches (totaling 60 miles) of the main stem San Joaquin River. As discussed in more detail below, salmon runs on the main stem San Joaquin River upstream of the confluence with the Merced River are being restored pursuant to the San Joaquin River Restoration Settlement Act of 2009 (San Joaquin Restoration Act).<sup>334</sup>

The San Joaquin River basin downstream of the confluence of the mainstem San Joaquin River and the Merced River also support salmon populations. Fall-run chinook salmon, presently not listed under the ESA, are able to spawn below the major dams on each of the three main tributaries to the San Joaquin River (the Stanislaus, Tuolumne, and Merced rivers), but their abundance has declined sharply in the last 10 years.<sup>335</sup> At present only the Stanislaus River is believed to support a population of steelhead, listed as threatened since 1998. Migratory survival measured for salmon through the southern Delta is poor compared to survival of Sacramento River outmigrants, and juvenile survival since 2000 has been on a steady and steep decline, as shown below.<sup>336</sup> Although information about steelhead in the San Joaquin system is limited, the available information suggests a significant decline.



**Figure F. Estimated natural production of chinook salmon in the San Joaquin River<sup>337</sup>**

Survival of salmonids migrating between the San Joaquin River basin and the Bay Delta Estuary is likely affected by many stressors, including high predation rates, high temperatures, low dissolved oxygen, agricultural contaminants, urban stormwater impacts, diversion into local agricultural diversions and the state and federal export facilities. Migration of salmonids is broadly believed to be guided by multiple cues – particular physical or chemical characteristics of the natal stream or migratory corridor that trigger or enable migration. Recent research suggests that, because most San Joaquin River water was diverted either upstream or as it enters the Delta, in almost all months of almost all years approximately 40 kilometers of San Joaquin River channels in the delta contained almost exclusively water derived from the Sacramento River.<sup>338</sup> The 40 kilometer discontinuity of non-natal water in the Bay Delta Estuary between the San Joaquin River and the ocean suggests that salmon and steelhead migratory abilities may be severely compromised due to the absence of the necessary physical or chemical cues usually found in the natal waters or particular migration corridors. The absence of these characteristics may compromise migration independent of the effects of predation, temperature, oxygen depletion, contaminants and diversion.

Retrospective analysis<sup>339</sup> of earlier sonic tagging data<sup>340</sup> found significant impairment of adult salmon migration to San Joaquin tributaries when total state and federal exports exceeded three times the volume of water entering from the San Joaquin River at Vernalis.<sup>341</sup> Prior to the drought of 1987-1992, ratios greater than 3:1 were uncommon, while during the drought such conditions occurred almost every year. Between 1992 and 2001, such conditions varied from year to year based on hydrology, with ratios above and below 3:1. However, October conditions (the center of the fall migration period) from 2001 to 2008 have exceeded the 3:1 ratio in all but two years (see below). As expected from the results of Hallock's and Mesick's research, returning numbers of salmon have been very low in all recent years.

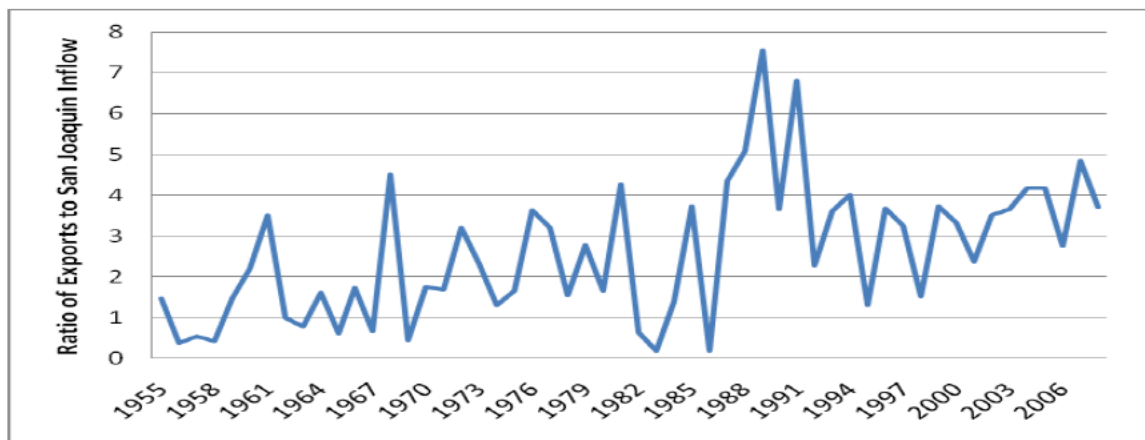


Figure G. Ratio of average combined CVP and SWP exports in October to monthly average October inflows of the San Joaquin River into the Delta.<sup>342</sup> Ratios less than 3 were associated with successful migration of adult salmon to San Joaquin River Tributaries.<sup>343</sup>

## b. Regulatory Status

The lower San Joaquin River and its major tributaries all include “Migration of Aquatic Species” as a designated use protected under the Clean Water Act.<sup>344</sup> The State Board, in its 1995 Water Quality Control Plan (unchanged in the 2006 revision), includes narrative criteria to protect the “Migration of Aquatic Species” designated use in the San Joaquin Basin.<sup>345</sup> The narrative criteria establish a goal of doubling natural salmon production on the tributary streams of the Central Valley consistent with the federal goal embodied in the Central Valley Project Improvement Act of 1992. The Basin Plans implementing these narrative criteria have usually included a combination of changes to flows, diversions rates and gate manipulations to protect fish migration corridors, with emphasis on juvenile salmon outmigration in the February through June period. Since the mid-1990’s, the primary implementation mechanism of the narrative salmon criteria with respect to fall run salmon has been through the Vernalis Adaptive Management Plan (VAMP). The VAMP is a fixed-term, multi-year experiment designed to evaluate salmon migration success under different combinations of San Joaquin River inflows at Vernalis and CVP/SWP export restrictions. The VAMP experiment is drawing to a close, and the State Board is considering replacement implementation approaches based in part on the results of the VAMP.

The Water Boards have adopted numeric criteria to address low dissolved oxygen in Delta waters.<sup>346</sup> Since at least the 1970’s, blockage of adult salmonid migration due to low dissolved oxygen has received much scientific attention. Dissolved oxygen barriers occur in the Stockton Deep Water Ship Channel on the lower San Joaquin River and on Old and Middle Rivers. A TMDL for dissolved oxygen in the Ship Channel was adopted by the Central Valley RWQCB on January 27, 2005 and approved by EPA on February 27, 2007.<sup>347</sup> The TMDL includes a phased control program to reduce the amount of oxygen demanding substances and their precursors. Early steps in implementing this TMDL include adoption of source controls from the outfall from the City of Stockton wastewater treatment plant and implementation of aeration facilities at the Port of Stockton. Longer term changes in channel form are also proposed for action by the Corps of Engineers, and studies are required both upstream and downstream on the sources and impacts of oxygen depletion.<sup>348</sup>

Chinook salmon and steelhead have specific temperature tolerances during various life-stages, including both juvenile and adult migration. Temperature conditions at various life stages may currently be the limiting factor for successful recruitment.<sup>349</sup> The Central Valley RWQCB Basin Plan includes narrative and numeric criteria protecting, among others, the migratory aquatic organisms designated use.<sup>350</sup> Recently, California Department of Fish and Game recommended that the Central Valley RWQCB list the San Joaquin and its tributaries as impaired waterbodies under the Clean Water Act for coldwater fisheries due to high water temperature. California Department of Fish and Game (CDFG) data show that EPA temperature guidance criteria for protecting salmon are frequently exceeded for all life stages.<sup>351</sup> In particular, CDFG has found that temperatures in the San Joaquin, Stanislaus, Tuolumne, and Merced Rivers exceeded EPA's adult chinook migration criterion (18 degrees) for 33% to 75% of the migration season, and for certain reaches, exceeded the criterion for juvenile migration for more than 50% of the season. The State Board declined to list the San Joaquin River and its tributaries as impaired due to elevated temperature, but EPA, in its review of the 303(d) list, added this listing when it acted on the State Board's submission.<sup>352</sup> Listing these water bodies as impaired is also supported by NMFS, who cite warm water temperatures below Central Valley dams as one of four major factors contributing to the decline of listed salmonids.<sup>353</sup>

The State Board has initiated a comprehensive reevaluation of San Joaquin River Flow and Southern Delta Salinity Objectives and a program of implementation to achieve these objectives. A staff report on the scientific bases for objectives was released in October 2010,<sup>354</sup> and final action on any changes is currently scheduled for 2012.<sup>355</sup> These objectives protect a suite of designated uses. With respect to fish and wildlife designated use protection (including salmonids), the report concludes that "a higher and more naturally variable inflow regime from the [San Joaquin River] to the Delta during the spring period (February through June) is needed."<sup>356</sup>

Pursuant to recent state law, the State Board recently issued recommendations on the flow needs necessary to protect public trust resources in the Bay Delta Estuary. This report specifically identifies the need for an October pulse flow of 3600 cfs for a minimum of ten days on the San Joaquin River and concurrent reduction in exports to ensure a hydraulic connection between the River and the San Francisco Bay to allow adult salmon upmigration.<sup>357</sup> These recommendations were identified in the report as "Class A," meaning there was more robust scientific information to support specific numeric criteria than some other recommendations. The report notes that this recommendation is based on the needs of fall-run salmon and that similar flow needs for migrating adult steelhead are largely unknown.

The 2009 NMFS Biological Opinion on the effects of SWP and CVP project operations included requirements specifically addressing the needs of San Joaquin steelhead.<sup>358</sup> Steelhead migrate during the same timeframe as fall-run salmon and are thought to respond similarly to environmental conditions. The NMFS Biological Opinion requires attraction flows in October of 1500 cfs from Goodwin Dam on the Stanislaus River.<sup>359</sup> No steelhead protection measures were included in the Delta for the adult migration season, September to November, largely because there is little information on steelhead migration and fall-run salmon are probably a poor

surrogate.<sup>360</sup> The ability of steelhead juveniles to hold over in their natal streams for more than one year may buffer them from some of the effects suffered by fall-run salmon.

The San Joaquin River Restoration Act<sup>361</sup> is a federal commitment to restoring chinook salmon on the San Joaquin River. The legislation implements a court settlement reached in 2007 amongst the USBR, the water contractors, and certain environmental groups. Under the settlement, specific physical restoration actions to reestablish the river channel and sufficient river flows will occur on the San Joaquin River in conjunction with reintroduction of spring-run salmon by December 31, 2012. The San Joaquin Restoration Act is focused on activities and habitat upstream of the confluence of the San Joaquin and Merced Rivers. The measured survival<sup>362</sup> and decreasing populations of salmon in the San Joaquin watershed suggest that fall-run salmon restoration to the San Joaquin River tributaries cannot succeed until the lower migratory corridor is more supportive of salmon migration. Much attention has focused on the outmigration of young fish, but there is reason for concern that adults are not able to migrate upstream.

### **c. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What role do gradients in physical and chemical constituents of water play in the suitability of the Bay and San Joaquin River basin migratory corridor for adult salmon?
2. What are the best measures of success for restoration of a migratory corridor? Could these measures be incorporated into new or revised biological criteria protecting the fish migration designated use?
3. How should temporal characteristics be included in the definition of the physical and/or chemical properties of a migration corridor based on a reference condition? What frequency and duration of such a corridor is required for salmonids? How might these characteristics change with the impacts of climate change?
4. How would establishing a migratory corridor for upmigrating adult chinook salmon succeed in improving adult migration success if temperatures in the river channels upstream of Vernalis are unchanged? How might actions to establish a migratory corridor in the south Delta also moderate temperature and/or dissolved oxygen problems in the San Joaquin River?

5. What additional efforts to improve dissolved oxygen regimes in the Delta are necessary to provide an adequate migratory corridor for San Joaquin salmonids?
6. What other information is available on the barriers to salmon migration on the San Joaquin River system?

### **3. Wetlands**

#### **a. Aquatic Resource Issues**

The extensive historical destruction of the Bay Delta Estuary's wetland and riparian areas increases the importance of the remaining wetland, riparian, and slough resources and the services they perform for Bay Delta water quality and flood protection. Over 95% of the historical 350,000 acres of tidal wetlands, sloughs, and riparian areas have been eliminated in the Bay Delta Estuary.<sup>363</sup> Wetlands, sloughs, and riparian areas in the upper watersheds of the Sacramento and San Joaquin River basins experienced a similar reduction in areal extent.<sup>364</sup> The elimination of these aquatic resources destroyed natural pollution filtration services (e.g., sediment, nitrogen, phosphorus, heavy metals)<sup>365</sup> and flood protection functions that protected the Bay Delta Estuary.

#### **b. Regulatory Status**

### **3. Wetlands**

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#### **b. Regulatory Status**

The Clean Water Act Section 404 Program is a significant component of the Clean Water Act regulatory framework in the Bay Delta Estuary. The California State Reclamation Board estimates that approximately 130,000 new homes<sup>369</sup> are at various stages of planning and implementation within the Bay Delta Estuary, potentially converting up to 55,000 acres<sup>370</sup> of tracts and islands that are near or below sea level to urban landscape. Other potential large projects that will result in the discharge of dredge or fill material to protected waters include building a new conveyance through or around the Delta to divert water from the Sacramento River south to the export facilities in the southern Delta, dredging of the Sacramento and



Stockton (San Joaquin) deepwater ship channels, tidal barrier projects, large-scale restoration activities, and a large-scale (22,000 acres) water storage project.

These potential large projects may require Clean Water Act Section 404 permits, and some have the capability to negatively impact water quality in the Bay Delta Estuary. While potentially improving export water quality and reducing fish entrainment at the south Delta export facilities, any conveyance project that diverts relatively clean Sacramento River water before it enters the Bay Delta Estuary also has the potential to exacerbate existing water pollution problems (such as increased salinity and low dissolved oxygen) in the Bay Delta Estuary. Dredging operations have the potential to re-suspend sediments and contaminants, thereby contributing to existing water quality impairments. Tidal barrier and storage projects have the potential to reduce circulations in areas of the Estuary that suffer from salinity and low dissolved oxygen impairments.

Urban development of Bay Delta Estuary rural islands and tracts eliminates the ability of these areas to retain and assimilate sediment and associated contaminants and store and absorb flood waters. Statewide, salt marsh and riverine wetlands are showing declining function as a result of urbanization.<sup>371</sup> Conversion of agricultural land use to urban land use on these islands and tracts may also adversely impact water quality as higher urban stormwater and POTW discharges increase the volume and array of pesticides and contaminants discharged into the adjacent waterways.

### **c. Request for Public Comment**

Many activities discussed in this notice are already the subject of a formal or informal rulemaking process conducted by either EPA or by a related state or federal agency. Nothing in this notice is intended to supersede those ongoing processes, nor does this notice constitute a decision under any of those processes. If commenters have submitted material in connection with those other processes that is believed to be relevant to the issues raised in this notice, the commenter may either reference the earlier submission (if it was submitted to EPA), attach the earlier submission (if it was submitted to a different agency), or, if appropriate, provide a link to the material online.

1. What different approaches under the Clean Water Act Section 404 program should EPA consider to improve the protection of aquatic resource functions in the Bay Delta Estuary?
2. What Clean Water Act Section 404 regulatory tools can be used more efficiently and effectively to protect Bay Delta Estuary wetlands and waters?
3. How might EPA take a more comprehensive (that is, broader scale) approach to aquatic resource protection under the Clean Water Act Section 404 in the Bay Delta Estuary?
4. What information exists that describes the relationship between the quantity and quality of wetlands and Bay Delta Estuary water quality and fish populations?

5. In light of projected impacts of climate change (including sea level rise and its effects on levee stability), what specific activities can EPA undertake to improve long-term protection of existing and future wetlands, especially those resources on subsided islands?

#### IV. Executive Order (E.O.) 12866, Regulatory Planning and Review

Under Executive Order 12866, entitled *Regulatory Planning and Review* (58 Federal Register 51,735, October 4, 1993), this is a “significant regulatory action.” Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

Because this action does not propose or impose any requirements and instead seeks comments and suggestions for the Agency to consider in possibly developing a subsequent proposed rule, the various statutes and Executive Orders that normally apply to rulemaking do not apply in this case. Should EPA subsequently determine to pursue a rulemaking, EPA will address the statutes and Executive Orders as applicable to that rulemaking.

Nevertheless, the Agency welcomes comments and/or information that would help the Agency to assess any of the following: the potential impact of a rule on small entities pursuant to the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 et seq.); potential impacts on federal, state, or local governments pursuant to the Unfunded Mandates Reform Act ((UMRA) (2 U.S.C. 1531-1538); federalism implications pursuant to Executive Order 13132, entitled *Federalism* (64 FR 43255, November 2, 1999); availability of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113; tribal implications pursuant to Executive Order 13175, entitled *Consultation and Coordination with Indian Tribal Governments* (65 FR 67249, November 6, 2000); environmental health or safety effects on children pursuant to Executive Order 13045, entitled *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885, April 23, 1997); energy effects pursuant to Executive Order 13211, entitled *Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use* (66 FR 28355, May 22, 2001); Paperwork burdens pursuant to the Paperwork Reduction Act (PRA) (44 U.S.C. § 3501); or human health or environmental effects on minority or low-income populations pursuant to Executive Order 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629, February 16, 1994). The Agency will consider such comments during the development of any subsequent rulemaking.

Dated: \_\_\_\_\_

Jared Blumenfeld,

Regional Administrator, Region 9

[FR Doc. \_\_\_\_\_ Filed \_\_\_\_\_]

BILLING CODE \_\_\_\_\_[NOTE: NEEDS NEW NUMBERS]

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<sup>1</sup> There is no commonly accepted precise geographic definition of the Bay Delta Estuary. The “legal Delta” is well-defined for purposes of the California Delta Protection Commission and related California statutes, but is not co-terminous with the functioning estuary. This ANPR will generally refer to the larger estuary upstream of the San Francisco Bay as the Bay Delta Estuary or the Estuary. It will also refer to the Delta, which usually means the “legal Delta” plus Suisun Marsh and Suisun Bay. Occasionally, this ANPR may also reference the Bay Delta Estuary watershed, which is a huge land area that includes the drainages of the Sacramento and San Joaquin River basins.

<sup>2</sup> Clean Water Act, 33 U.S.C. §§ 1281-1387 (2006).

<sup>3</sup> “Anadromous” species are those, such as chinook salmon and steelhead, that spend at least some of their life cycle in salt water. Usually, these species return to freshwater to spawn.

<sup>4</sup> Water years in California are defined as October 1 through the following September 30. For example, the 2011 water year began October 1, 2010 and continues through September 30, 2011. Water years in California are categorized based on the particular rainfall that year. The categories are wet, above normal, below normal, dry, and critically dry.

<sup>5</sup> Endangered Species Act, 16 U.S.C. §§ 1531-1544 (2006).

<sup>6</sup> See CAL. DEP’T OF WATER RES. & BUREAU OF RECLAMATION, WATER SUPPLY CONDITIONS 2009 (Aug., 2009), available at <http://www.water.ca.gov/news/newsreleases/2009/08122009martinmilligan2.pdf> (suggests that approximately a quarter (500 thousand acre feet) of the 2.1 million acre feet water export shortfall in 2009 was due to new environmental restrictions, whereas three quarters (1.6 million acre feet) of the shortfall was due to the drought itself).

<sup>7</sup> See Press Release, U.S. Dep’t of the Interior, Secretary Salazar, Senior Administration and Congressional Officials Hold Town Hall Meeting on California Water Shortage (June 28, 2009), available at [http://www.doi.gov/news/pressreleases/2009\\_06\\_28\\_release.cfm](http://www.doi.gov/news/pressreleases/2009_06_28_release.cfm) (discussing several water augmentation initiatives).

<sup>8</sup> California Bay-Delta Memorandum of Understanding among Federal Agencies (Sept. 29, 2009), available at <http://www.doi.gov/documents/BayDeltaMOUSigned.pdf>.

<sup>9</sup> INTERIM FEDERAL ACTION PLAN FOR THE CALIFORNIA BAY-DELTA (Dec. 22, 2009), available at <http://www.doi.gov/documents/CAWaterWorkPlan.pdf>.

<sup>10</sup> Citations to these many reports and reviews are provided below, as each issue is discussed in detail.

<sup>11</sup> RANDALL BAXTER, ET AL., PELAGIC ORGANISM DECLINE PROGRESS REPORT: 2010 SYNTHESIS OF RESULTS (2010), available at <http://www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf>.

<sup>12</sup> The State Board, Central Valley RWQCB, and San Francisco Regional Water Quality Control Board (San Francisco RWQCB) will sometimes be referred to collectively as the “Water Boards.”

<sup>13</sup> As noted in more detail below, much of EPA’s statutory mandate is to perform oversight and review of state water quality agency activities.

<sup>14</sup> Federal Insecticide, Fungicide and Rodenticide Act, 7 U.S.C. § 136-136y (2006).

<sup>15</sup> STATE WATER RES. CONTROL BD., CENT. VALLEY WATER BD., & SAN FRANCISCO BAY WATER BD., STRATEGIC WORKPLAN FOR ACTIVITIES IN THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY (2008), available at [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/strategic\\_plan/docs/baydelta\\_workplan\\_final.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/strategic_plan/docs/baydelta_workplan_final.pdf).

<sup>16</sup> National Environmental Policy Act, 42 U.S.C. § 4321-4370f (2006).

<sup>17</sup> Anti-Deficiency Act, 31 U.S.C. § 1341 (2007).

<sup>18</sup> Natural Communities Conservation Plan Act, CAL. FISH & GAME CODE § 2800-2835 (2003).

<sup>19</sup> Although the scope of the BDCP covers at least nine listed aquatic species and a geographic area of over one-half million acres, the BDCP is not intended to be a comprehensive Delta recovery plan. By its own terms, it is addressing only the operations of the state and federal water export projects and their impacts on listed species and their habitat.

<sup>20</sup> CAL. WATER CODE § 85300-85350 (2010).

<sup>21</sup> DELTA VISION BLUE RIBBON TASK FORCE, DELTA VISION STRATEGIC PLAN (Oct. 2008), available at [http://deltavision.ca.gov/StrategicPlanningProcess/StaffDraft/Delta\\_Vision\\_Strategic\\_Plan\\_standard\\_resolution.pdf](http://deltavision.ca.gov/StrategicPlanningProcess/StaffDraft/Delta_Vision_Strategic_Plan_standard_resolution.pdf); Estimate of federal and state endangered and threatened species based on discussion with U.S. Fish & Wildlife Service biologists; BAY DELTA CONSERVATION PLAN, STEERING COMMITTEE WORKING DRAFT (Nov. 18, 2010), available at [http://baydeltaconservationplan.com/Libraries/Whats\\_in\\_Plan/draft\\_BDCPreport\\_11292010\\_ClickableLinks7.pdf](http://baydeltaconservationplan.com/Libraries/Whats_in_Plan/draft_BDCPreport_11292010_ClickableLinks7.pdf);

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CALFED BAY DELTA PROGRAM, MULTI-SPECIES CONSERVATION STRATEGY, FINAL PROGRAMMATIC EIS (July 7, 2000), available at [http://dfg.ca.gov/erp/envcomp\\_mscs.asp](http://dfg.ca.gov/erp/envcomp_mscs.asp).

<sup>22</sup> JAY LUND ET AL., ENVISIONING FUTURES FOR THE SACRAMENTO-SAN JOAQUIN DELTA (Feb. 2007), available at <http://www.ppic.org/main/publication.asp?i=671>; See DELTA VISION BLUE RIBBON TASK FORCE, OUR VISION FOR THE CALIFORNIA DELTA (Jan. 2008), available at

[http://deltavision.ca.gov/BlueRibbonTaskForce/FinalVision/Delta\\_Vision\\_Final.pdf](http://deltavision.ca.gov/BlueRibbonTaskForce/FinalVision/Delta_Vision_Final.pdf) (The current status and future threats to the Estuary have been well documented. Good summaries of these issues can be found in these sources).

<sup>23</sup> JOHN E. SKINNER, AN HISTORICAL REVIEW OF THE FISH AND WILDLIFE RESOURCES OF THE SAN FRANCISCO BAY AREA 226 (Cal. Dept. of Fish and Game, Water Projects Branch Rep. No. 1, 1962), available at

[http://www.estuaryarchive.org/archive/skinner\\_1962/](http://www.estuaryarchive.org/archive/skinner_1962/); W.A. Bennett & Peter Moyle, *Where Have All the Fishes Gone? Interactive Factors Producing Fish Declines in the Sacramento-San Joaquin Estuary*, in SAN FRANCISCO BAY: THE ECOSYSTEM 519, 519-42 (J.T. Hollibaugh ed., 1996); PETER MOYLE ET AL., 2010 CHANGING

ECOSYSTEMS: A BRIEF ECOLOGICAL HISTORY OF THE DELTA (Feb. 2010), available at

[http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/docs/intro\\_delta\\_history\\_14feb2010.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/intro_delta_history_14feb2010.pdf).

<sup>24</sup> Ted Sommer, et al., *The Collapse of Pelagic Fishes in the Upper San Francisco Estuary*, 32 FISHERIES, n.6, 270, 270-77 (2007) (Graphs originally prepared for Ted Sommer, et al., updated for 2008 and 2009 with data from Cal. Dep't of Fish & Game, <http://www.dfg.ca.gov/delta/projects.asp?ProjectID=FMWT> (last visited Nov. 16, 2010)).

<sup>25</sup> Fall run chinook salmon is also an important food source for the southern population of killer whales, which are listed as threatened under the Endangered Species Act.

<sup>26</sup> Since harvest data are a large part of the population estimation tool, data for these three years are probably not directly comparable with earlier yearly population estimates.

<sup>27</sup> S.T. LINDLEY ET AL., WHAT CAUSED THE SACRAMENTO RIVER FALL CHINOOK STOCK COLLAPSE? (2009), available at <http://swr.nmfs.noaa.gov/media/SalmonDeclineReport.pdf>.

<sup>28</sup> *Id.*

<sup>29</sup> Sommer et al., *supra* note 24; Alan Jassby & T.M. Powell, *Hydrodynamic Influences on Interannual Chlorophyll Variability in an Estuary: Upper San Francisco Bay Delta*, 39 ESTUARINE, COASTAL & SHELF SCI. 595, 595-618 (1994); W.J. Kimmerer, *Effects of Freshwater Flow on Abundance of Estuarine Organisms: Physical Effects or Trophic Linkages?*, 243 MARINE ECOLOGY PROGRESS SERIES 39, 39-55 (2002).

<sup>30</sup> James R. Thomson et al., *Bayesian Change-Point Analysis of Abundance Trends for Pelagic Fishes in the Upper San Francisco Estuary*, 20 ECOLOGICAL APPLICATIONS 1431, 1431-48 (2010); Ralph Mac Nally et al., *An Analysis of Pelagic Species Decline in the Upper San Francisco Estuary using Multivariate Autoregressive Modeling (MAR)*, 20 ECOLOGICAL APPLICATIONS, 167, 167-80 (2010).

<sup>31</sup> The Fall Midwater Trawl is an ongoing annual survey of pelagic species abundance conducted by the California Department of Fish and Game. Some of the numbers in the 1970's are not comparable because the survey was not conducted in 1974, 1976 or in part of the fall of 1978. Therefore, the entries on the chart represent "no data." In addition, the index for longfin smelt shows substantial variation over the period, and graph presents only the lower quartile of the actual range of index numbers.

<sup>32</sup> The IEP is a consortium of nine state and federal agencies plus the San Francisco Estuary Institute. Since the 1970's, it has, primarily through its member entities, collected and analyzed data on water quality, fish, wildlife and related hydrodynamic processes in the Bay Delta Estuary.

<sup>33</sup> BAXTER ET AL., *supra* note 11; RANDALL BAXTER, ET AL., PELAGIC ORGANISM DECLINE PROGRESS REPORT: 2007 SYNTHESIS OF RESULTS (2008), available at [http://www.science.calwater.ca.gov/pdf/workshops/POD/2007\\_IEP-POD\\_synthesis\\_report\\_031408.pdf](http://www.science.calwater.ca.gov/pdf/workshops/POD/2007_IEP-POD_synthesis_report_031408.pdf); CHUCK ARMOR, ET. AL, INTERAGENCY ECOLOGICAL PROGRAM SYNTHESIS OF 2005 WORK TO EVALUATE THE PELAGIC ORGANISM DECLINE IN THE UPPER SAN FRANCISCO ESTUARY (2005).

<sup>34</sup> Lenny F. Grimaldo, et al., *Factors Affecting Fish Entrainment into Massive Water Diversions in a Tidal Freshwater Estuary: Can Fish Losses be Managed?*, 29 N. AM. J. OF FISHERIES MGMT. 1253, 1253-70 (2009).

<sup>35</sup> *Id.* Entrainment refers to the diversion and probable loss of fish at the export facilities.

<sup>36</sup> Frederick Feyrer, M.L. Nobriga & T.R. Sommer, *Multi-Decadal Trends for Three Declining Fish Species: Habitat Patterns and Mechanisms in the San Francisco Estuary, California USA*, 64 CAN. J. OF FISHERIES & AQUATIC SCI. 723, 723-34 (2007).

<sup>37</sup> William Bennett, *Critical Assessment of the Delta Smelt Population in the San Francisco Estuary, California*, 3 SAN FRANCISCO ESTUARY & WATERSHED SCI. 1, 1-70 (2005), available at <http://repositories.cdlib.org/jmie/sfews/vol3/iss2/art1>; M.L. Nobriga & B. Herbold, *The Little Fish in California's Water Supply: a Literature Review and Life-History Conceptual Model for Delta Smelt (Hypomesus transpacificus)*

for the Delta Regional Ecosystem Restoration and Implementation Plan (DRERIP) (2010) (in review)(on file with authors); Frederick Feyrer, T. Sommer & S.B. Slater, *Old School vs. New School: Status of Threadfin Shad (Dorosomaypetenense) Five Decades After its Introduction to the Sacramento-San Joaquin Delta*, 7 SAN FRANCISCO ESTUARY & WATERSHED SCI. 1, 1-17 (2009), available at <http://repositories.cdlib.org/jmie/sfews/vol7/iss1/art3>.

<sup>38</sup> LINDLEY ET AL., *supra* note 22; JAY R. LUND ET AL., PUB. POLICY INST. OF CAL., COMPARING FUTURES FOR THE SACRAMENTO-SAN JOAQUIN DELTA (2008), available at [www.ppic.org/content/pubs/report/r\\_708EHR.pdf](http://www.ppic.org/content/pubs/report/r_708EHR.pdf).

<sup>39</sup> James Cloern et al., *Biological Communities in San Francisco Bay Track a North Pacific Climate Shift*, 37 GEOPHYSICAL RES. LETTERS 1, 1-6 (2010).

<sup>40</sup> Agency for Toxic Substances & Disease Registry (ATSDR), Fact Sheet: Pyrethrins and Pyrethroids (2003), available at <http://www.atsdr.cdc.gov/tfacts155.pdf> ("Pyrethroids are manufactured chemicals that are very similar in structure to the pyrethrins, but are often more toxic to insects as well as to mammals, and last longer in the environment than the pyrethrins....Pyrethrins are naturally-occurring compounds with insecticidal properties that are found in pyrethrum extract from certain chrysanthemum flowers").

<sup>41</sup> W.A. BENNETT, J.A. HOBBS & S.J. TEH, INTERPLAY OF ENVIRONMENTAL FORCING AND GROWTH-SELECTIVE MORTALITY IN THE POOR YEAR-CLASS SUCCESS OF DELTA SMELT IN 2005 (2008), available at [http://www.science.calwater.ca.gov/pdf/workshops/POD/2008\\_final/Bennett\\_PODDeltaSmelt2005Report\\_2008.pdf](http://www.science.calwater.ca.gov/pdf/workshops/POD/2008_final/Bennett_PODDeltaSmelt2005Report_2008.pdf).

<sup>42</sup> Some pyrethroid insecticides are toxic to invertebrates, which are food for pelagic fish, at or near the low "detection level." The "detection level" is the concentration at which feasible test methods can detect the presence of a constituent.

<sup>43</sup> Kathryn Kuivila & G.E. Moon, *Potential Exposure of Larval and Juvenile Delta Smelt to Dissolved Pesticides in the Sacramento-San Joaquin Delta, California*, 39 AM. FISHERIES SOC'Y SYMP. 229, 229-42 (2004).

<sup>44</sup> Weston et al., *Distribution and Toxicity of Sediment-Associated Pesticides in Agriculture-Dominated Water Bodies of California's Central Valley*, 38 ENVTL. SCI. & TECH. 2752, 2752-59 (2004).

<sup>45</sup> Richard C. Dugdale, F.P. Wilkerson, V.E. Hogue & A. Marchi, *The Role of Ammonium and Nitrate in Spring Bloom Development in San Francisco Bay*, 73 ESTUARINE, COASTAL & SHELF SCI. 17, 17-29 (2007).

<sup>46</sup> Erin Lee Hestir, D. Schoellhammer, T. Morgan & S.L. Ustin, Trends in Submerged Aquatic Vegetation and Turbidity in the Sacramento-San Joaquin Delta, Presentation at the 5<sup>th</sup> Biennial CALFED Science Conference (Oct. 22-24, 2008); M.J. Santos, L.W. Anderson & S.L. Ustin, *Effects of Invasive Species on Plant Communities: An Example Using Submersed Aquatic Plants at the Regional Scale*, BIOLOGICAL INVASIONS 1, 1-15 (Jul. 28, 2010), available at <http://www.springerlink.com/content/b883gr221203xr37/> (Despite these treatments, the area occupied by submerged aquatic vegetation continues to spread at an average annual rate of 13%. In recent years treatment has focused solely on Franks Tract for aquatic vegetation control and has been successful in that locale).

<sup>47</sup> M.F.L.L. Lurling & I. Roessink, *On the Way to Cyanobacterial Blooms: Impact of the Herbicide Metribuzin on the Competition Between a Green Alga (Scenedesmus) and a Cyanobacterium (Microcystis)*, 65 CHEMOSPHERE 618, 618-26 (2006); Hans Paerl, *Nutrient and Other Environmental Controls of Harmful Cyanobacterial Blooms Along the Freshwater-Marine Continuum in Cyanobacterial Harmful Algal Blooms: State of the Science and Research Needs*, 619 ADVANCES IN EXPERIMENTAL MED. & BIOLOGY 217, 217-37 (2008).

<sup>48</sup> Patricia M. Glibert, *Long-term Changes in Nutrient Loading and Stoichiometry and their Relationships with Changes in the Food Web and Dominant Pelagic Fish Species in the San Francisco Estuary, California*, 18 REVIEWS IN FISHERY SCI. 211, 211-32 (2010) (The existence of multiple interacting stressors can confound results of single-stressor research. For example, increased ammonia loading is linked to decreased diatom production); Kimmerer, *supra* note 29 (Equally consistent with the data is the establishment of overbite clams, increasing diatom consumption); James R. Thomson et al., *Bayesian Change-Point Analysis of Abundance Trends for Pelagic Fishes in the Upper San Francisco Estuary*, 20 ECOLOGICAL APPLICATIONS 1431, 1431-48 (2010) (Both factors are probably responsible for the decline in diatoms in the low salinity zone but both factors are also affected by hydrological changes: low river flows due to drought have likely increased the effects of ammonia loading while stabilized salinity regimes have allowed high densities of overbite clams to accrue in the western delta).

<sup>49</sup> PETER MOYLE ET AL., DELTA SOLUTIONS CTR. FOR WATERSHED SCI., UNIV. OF CAL., DAVIS, HABITAT VARIABILITY AND COMPLEXITY IN THE UPPER SAN FRANCISCO ESTUARY (2010), available at <http://deltasolutions.ucdavis.edu/pdf/WorkingPapers/HabitatVariabilityandComplexity-2010Draft.pdf>; BROWN ET AL., IEP POD WORKPLAN 2010 (forthcoming 2010), available at [http://calwater.ca.gov/science/pod/pod\\_index.html](http://calwater.ca.gov/science/pod/pod_index.html); James Cloern, Senior Research Scientist, U.S. Geological Survey, Historical Perspective on Human Disturbance in the Sacramento-San Joaquin Delta Ecosystem, Presentation at the National Research Council's Meeting on Sustainable Water and Environmental Management in the California Bay-Delta (July 13, 2010); Anke Mueller-

Solger, IEP Lead Scientist Delta Stewardship Council, IEP Science Highlights, 2009-2010, Summary Presentation at IEP Annual Workshop (May 25, 2010), *available at* <http://www.water.ca.gov/iep/docs/052510Science.pdf> ;

Thomson et al., *supra* note 48; Mac Nally et al., *supra* note 30.

<sup>50</sup> Hestir, Schoellhammer, Morgan & Ustin, *supra* note 46; Santos, Anderson & Ustin, *supra* note 46; Matthew L. Nobriga, T. Sommer, F. Feyrer & K. Fleming, *Long-Term Trends in Summertime Habitat Suitability for Delta Smelt (Hypomesus transpacificus)*, 6 SAN FRANCISCO ESTUARY & WATERSHED SCI. 1, 1 n.1 (Feb. 2008), *available at* <http://repositories.cdlib.org/jmie/sfews/vol6/iss1/art1>.

<sup>51</sup> Peter B. Moyle & W.A. Bennett, *The Future of the Delta Ecosystem and its Fish*, in COMPARING FUTURES FOR THE SACRAMENTO-SAN JOAQUIN DELTA (TECHNICAL APPENDIX D) (Pub. Policy Inst. of Cal. ed., 2008), *available at* [http://www.ppic.org/content/pubs/other/708EHR\\_appendixD.pdf](http://www.ppic.org/content/pubs/other/708EHR_appendixD.pdf).

<sup>52</sup> LUND, *supra* note 22; Cloern *supra* note 49.

<sup>53</sup> VIVIAN GADDIE, MICHAEL MIERZA & JENNY MARR, *LEVEE FAILURES IN THE SACRAMENTO-SAN JOAQUIN RIVER DELTA*, *available at* [http://www.dwr.water.ca.gov/floodmgmt/docs/DeltaLeveeFailures\\_FMA\\_200709.pdf](http://www.dwr.water.ca.gov/floodmgmt/docs/DeltaLeveeFailures_FMA_200709.pdf) (last visited Nov. 3, 2010).

<sup>54</sup> Letter from Phillip L. Isenberg, Chair, Delta Vision Blue Ribbon Task Force, to Arnold Schwarzenegger, Governor, Cal. (Mar. 24, 2008), *available at* [http://deltavision.ca.gov/BlueRibbonTaskForce/Communications/SLR\\_Followup\\_Letter\\_To\\_Governor\\_9-4-08.pdf](http://deltavision.ca.gov/BlueRibbonTaskForce/Communications/SLR_Followup_Letter_To_Governor_9-4-08.pdf). (The Governor's Delta Vision Blue Ribbon Task Force estimated and adopted for its planning purposes a projected sea level rise of 55 inches by the year 2100).

<sup>55</sup> CAL. DEPT. OF WATER RESOURCES, *MANAGING AN UNCERTAIN FUTURE: CLIMATE CHANGE ADAPTATION STRATEGIES FOR CALIFORNIA'S WATER* (Oct. 2008), *available at* <http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf>.

<sup>56</sup> Given that 20 million Californians get some or all of their drinking water from the Bay Delta Estuary, it may seem counterintuitive that EPA is not including the Public Health Service Act, 42 U.S.C. § 300f et seq. (2006) (generally referred to as the Safe Drinking Water Act) as one of the major statutes affecting Bay Delta Estuary aquatic resources. That Act, however, focuses on water quality "at the tap" and on the activities of public water supply agencies. Although the targeted drinking water parameters at the tap are a very relevant consideration in Bay Delta Estuary resource management, the regulatory tools for protecting sources of drinking water are found primarily in the Clean Water Act.

<sup>57</sup> 40 C.F.R. § 131.3(i) (Dec. 14, 1994) (Under EPA regulations, a water quality standard consists of a "designated use or uses for the waters of the United States and water quality criteria for such waters based upon such uses").

<sup>58</sup> 40 C.F.R. § 131.2 (Dec. 22, 1992) (Under EPA regulations, "Serve the purposes of the Act" (as defined in Sections 101(a), 101(a)(2), and 303(c) of the Act) means that water quality standards should: (1) include provisions for restoring and maintaining chemical, physical, and biological integrity of state and tribal waters, (2) provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water ("fishable/swimmable"), and (3) consider the use and value of state and tribal waters for public water supplies, propagation of fish and wildlife, recreation, agricultural and industrial purposes, and navigation).

<sup>59</sup> The Central Valley RWQCB incorporates any final State Board criteria into their plans.

<sup>60</sup> STATE WATER RES. CONTROL BD., *WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY* (Dec. 13, 2006), *available at* [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/wq\\_control\\_plans/2006wqcp/docs/2006\\_plan\\_final.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_plan_final.pdf).

<sup>61</sup> 33 U.S.C. § 1342(b)(1)(B) (2008).

<sup>62</sup> 33 U.S.C. § 1311 (a)-(b) (1995).

<sup>63</sup> 33 U.S.C. §§ 1311(b)(2) (1995), 1314(b) (2000), 1316 (1972), 1317(b)-(c) (1987).

<sup>64</sup> 33 U.S.C. §§ 1311(a)-(b) (1995), 1342 (2008).

<sup>65</sup> 33 U.S.C. §§ 1317(b)-(c) (1987).

<sup>66</sup> The major POTWs affecting the Estuary are listed in Section III.A.2.

<sup>67</sup> Water Board actions on these permit renewals are not solely the result of the POD issues. The Boards are required to look at a broad range of water quality issues in their permit decisions.

<sup>68</sup> City of Stockton's Waste Water Treatment Plant NPDES permit, Order No. R5-2002-0083 (2002).

<sup>69</sup> Cease and Desist Order, Order No. R5-2002-0084 (2002).

<sup>70</sup> 55 Fed. Reg. 47990 (Nov. 16, 1990).

<sup>71</sup> 64 Fed. Reg. 68721 (Dec. 8, 1999).

<sup>72</sup> See 33 U.S.C. § 402(p) (2000); 40 C.F.R. § 122.26 (June 12, 2006).

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<sup>73</sup> 40 C.F.R. § 122.26(b)(8) (June 12, 2006).

<sup>74</sup> 40 C.F.R. § 122.26(b)(16) (June 12, 2006).

<sup>75</sup> See Water Quality Order, Order No. 2003-0005-DWQ (2003).

<sup>76</sup> 40 C.F.R. § 122.26(b)(14)(x) (June 12, 2006).

<sup>77</sup> 40 C.F.R. § 122.26(b)(15) (June 12, 2006).

<sup>78</sup> California Construction General Permit, Order No. 2009-0009-DWQ (2009).

<sup>79</sup> 40 C.F.R. § 122.26(a)(9)(i)(C)-(D) (June 12, 2006).

<sup>80</sup> 40 C.F.R. § 122.35 9 (Dec. 8, 1999).

<sup>81</sup> 33 U.S.C. § 1313(d)(1)(A) (2000).

<sup>82</sup> 40 C.F.R. § 130.7(b) (Mar. 19, 2003).

<sup>83</sup> 40 C.F.R. § 130.7(d)(1) (Mar. 19, 2003).

<sup>84</sup> 33 U.S.C. § 1313(d)(2) (2000).

<sup>85</sup> 33 U.S.C. § 1313(d)(1)(C) (2000).

<sup>86</sup> 40 C.F.R. § 130.2(g)-(i) (Mar. 19, 2003).

<sup>87</sup> See *Dioxin/Organochlorine Ctr. v. Clarke*, 57 F.3d 1517, 1520 (9th Cir. 1995).

<sup>88</sup> 40 C.F.R. § 130.7(c)(1)(ii) (Mar. 19, 2003) (In addition to the listing process for impaired waters described above, Section 303(d)(3) requires States to identify and estimate TMDLs for waters that are not impaired. Unlike TMDLs established under Section 303(d)(1), States are not required to submit TMDLs estimated pursuant to Section 303(d)(3) to EPA. Information developed under Section 303(d)(3) may be used to protect waters to ensure they continue to meet WQS).

<sup>89</sup> 33 U.S.C. § 1313(d)(2) (2000).

<sup>90</sup> 33 U.S.C. § 1313(d)(2) (2000).

<sup>91</sup> 40 C.F.R. § 122.44(d)(1)(vii)(B) (Apr. 11, 2007); *NRDC v. EPA*, 915 F.2d 1316, 1316 (9th Cir. 1990).

<sup>92</sup> See *NRDC*, 915 F.2d at 1316 (noting that Clean Water Act does not “directly prohibit” release of pollutants from nonpoint sources).

<sup>93</sup> STATE WATER RES. CONTROL BD., 2010 INTEGRATED REPORT CLEAN WATER ACT SECTIONS 303(D) AND 305(B) (Apr. 19, 2010), *available at* [http://www.waterboards.ca.gov/water\\_issues/programs/tmdl/integrated2010.shtml](http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml) (On August 4, 2010, the State Water Resources Control Board reviewed and approved the 2010 Integrated Report, including the 303(d) listing); See Letter from Alexis Strauss, Water Div. Dir., U.S. EPA Region IX, to Tom Howard, Exec. Officer, State Water Res. Control Bd. (Nov. 12, 2010), *available at* <http://www.epa.gov/region9/water/tmdl/303d-pdf/EPAsPartial-Approval-Partial-DisapprovLtr-Enclos-Ca2008-2010-303dList.pdf>.

<sup>94</sup> STATE WATER RES. CONTROL BD., CENT. VALLEY REG’L WATER QUALITY CONTROL BD. & SAN FRANCISCO BAY REG’L WATER QUALITY CONTROL BD., *supra* note 15.

<sup>95</sup> U.S. EPA Fact Sheet, Wetland Regulatory Authority, [http://water.epa.gov/type/wetlands/outreach/upload/reg\\_authority\\_pr.pdf](http://water.epa.gov/type/wetlands/outreach/upload/reg_authority_pr.pdf) (last visited Nov. 3, 2010) (the Clean Water Act Section 404 program is conventionally referred to as the “Wetlands” program however, it applies to dredge and fill activities in *all* Clean Water Act jurisdictional waters. The types of waters that are jurisdictional under the Clean Water Act include, but are not limited to, streams, rivers, natural ponds, lakes, impoundments, estuaries, bays, ocean, mudflats, sloughs, and wetlands).

<sup>96</sup> For example, fill activities that increase water velocity (armoring stream banks, straightening streams, piping streams in culverts) also increase the ability of moving water to entrain and carry sediment and other contaminants to downstream locations and decrease the likelihood that contaminants will settle out of the water column. Fill activities like boat dock construction may have minimal direct impact to an aquatic resource, but the increased boat activity has indirect negative water quality impacts from re-suspension of sediments, loss of subtidal vegetation, and combustion engine pollution. Dredging activities that require Clean Water Act Section 404 permits can also negatively affect water quality by digging up bottom sediments and suspending these sediments in the water column, restricting light penetration to aquatic plants and reintroducing contaminants such as pesticides into sediments.

<sup>97</sup> Clean Water Act 404(b)(1) Guidelines, 40 C.F.R. § 230.10 (Oct. 28, 2010).

<sup>98</sup> U.S. EPA Fact Sheet, Functions and Values of Wetlands, [http://water.epa.gov/type/wetlands/upload/2006\\_08\\_11\\_wetlands\\_fun\\_val.pdf](http://water.epa.gov/type/wetlands/upload/2006_08_11_wetlands_fun_val.pdf) (last visited Nov. 3, 2010).

<sup>99</sup> Pesticides; Procedural Regulations for Registration Review, 71 Fed. Reg. 45719 (Aug. 9, 2006); 40 C.F.R. pt. 155 subpt. C (Aug. 9, 2006).

<sup>100</sup> The National Research Council panel currently evaluating several Bay Delta Estuary science issues may be “ranking” factors associated with the decline of ESA listed species and other at-risk species. That ranking and the

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associated report is not due until 2011. Similarly, the Delta Independent Science Board has initiated a process to evaluate and rank the relative importance of multiple stressors and, especially, to consider the interactive effects of these multiple stressors. See DELTA STRESSORS WORKSHOP, MEETING NOTICE (Dec. 30, 2010), *available at* [http://www.deltacouncil.ca.gov/delta\\_science\\_program/pdf/isb/d-isb\\_2011\\_01\\_workshop\\_stressors\\_mtg\\_notice\\_122810.pdf](http://www.deltacouncil.ca.gov/delta_science_program/pdf/isb/d-isb_2011_01_workshop_stressors_mtg_notice_122810.pdf).

<sup>101</sup> STATE WATER RES. CONTROL BD., *supra* note 93.

<sup>102</sup> Clean Water Act, 33 U.S.C. § 1362(13) (2006) (“The term ‘toxic pollutant’ means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring”).

<sup>103</sup> MICHAEL L. JOHNSON ET AL., EVALUATION OF CHEMICAL, TOXICOLOGICAL, AND HISTOPATHOLOGICAL DATA TO DETERMINE THEIR ROLE IN THE PELAGIC ORGANISM DECLINE, (Apr. 20, 2010), *available at* [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/comprehensive\\_monitoring\\_program/contaminant\\_synthesis\\_report.pdf](http://www.swrcb.ca.gov/rwqcb5/water_issues/delta_water_quality/comprehensive_monitoring_program/contaminant_synthesis_report.pdf).

<sup>104</sup> Glibert, *supra* note 48.

<sup>105</sup> Erin L. Amweg, Donald P. Weston, Jing You & Michael J. Lydy, *Pyrethroid Insecticides and Sediment Toxicity in Urban Creeks from California and Tennessee*, 40 ENVTL. SCI. TECH. 1700, 1700–06 (2006).

<sup>106</sup> DAVID OSTRACH ET AL., THE ROLE OF CONTAMINANTS, WITHIN THE CONTEXT OF MULTIPLE STRESSORS, IN THE COLLAPSE OF THE STRIPED BASS POPULATION IN THE SAN FRANCISCO ESTUARY AND ITS WATERSHED (2009), *available at*

[http://www.science.calwater.ca.gov/pdf/workshops/POD/POD\\_yr2\\_Ostrach\\_090522\\_report\\_final\\_djo.pdf](http://www.science.calwater.ca.gov/pdf/workshops/POD/POD_yr2_Ostrach_090522_report_final_djo.pdf).

<sup>107</sup> U.S. ENVTL. PROT. AGENCY, 1999 UPDATE OF AMBIENT WATER QUALITY CRITERIA FOR AMMONIA (1999), *available at*

<http://www.epa.gov/waterscience/standards/ammonia/99update.pdf>.

<sup>108</sup> David John Randall & T.K.N. Tsui, *Ammonia Toxicity in Fish*, 45 MARINE POLLUTION BULLETIN 17, 17-23 (2002).

<sup>109</sup> U.S. ENVTL. PROT. AGENCY, DRAFT 2009 UPDATE AQUATIC LIFE AMBIENT WATER QUALITY CRITERIA FOR AMMONIA – FRESHWATER (2009), *available at*

[http://water.epa.gov/scitech/swguidance/waterquality/standards/criteria/aqlife/pollutants/ammonia/upload/2009\\_12\\_23\\_criteria\\_ammonia\\_2009update.pdf](http://water.epa.gov/scitech/swguidance/waterquality/standards/criteria/aqlife/pollutants/ammonia/upload/2009_12_23_criteria_ammonia_2009update.pdf); U.S. ENVTL. PROT. AGENCY, *supra* note 107.

<sup>110</sup> U.S. ENVTL. PROT. AGENCY, *supra* note 107.

<sup>111</sup> IDA FLORES ET AL., ACUTE AND CHRONIC TOXICITY OF AMMONIA ON *PSEUDODIAPTOMUS FORBESI* (2010), *available at* <http://www.water.ca.gov/iep/docs/052510LesmeisterB.pdf>.

<sup>112</sup> Randall & Tsui, *supra* note 108.

<sup>113</sup> Ruth Francis-Floyd, Craig Watson, Denise Petty & Deborah B. Poude, *Ammonia in Aquatic Systems*, UNIV. OF FLA. IFAS EXTENSION, FA16 (2009), *available at* <http://edis.ifas.ufl.edu/fa031>.

<sup>114</sup> U.S. EPA, National Nutrient Strategy, <http://www.epa.gov/waterscience/criteria/nutrient/strategy/index.html> (last visited Oct. 18, 2010).

<sup>115</sup> Alan Jassby, *Phytoplankton in the Upper San Francisco Estuary: Recent Biomass Trends, their Causes, and their Trophic Significance*, 6 SAN FRANCISCO ESTUARY & WATERSHED SCI. 1 (Feb. 2008), *available at* <http://escholarship.org/uc/item/71h077r1>.

<sup>116</sup> *Id.*; Frances P. Wilkerson et al., *Phytoplankton Blooms and Nitrogen Productivity in the San Francisco Bay*, 29(3) ESTUARIES & COASTS 401, 401-16 (2006).

<sup>117</sup> Central Valley Regional Water Quality Control Board, Ammonia Summit Summary (Aug. 18-19, 2009), [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/index.shtml](http://www.swrcb.ca.gov/rwqcb5/water_issues/delta_water_quality/ambient_ammonia_concentrations/index.shtml) (last visited Nov. 16, 2010); Jassby, *supra* note 115; 2010 Ammonia Update Memorandum from Christopher Foe, Cal. Reg'l Water Quality Bd. Cent. Valley Region to Jeff Bruns & Karen Taberski, Water Boards (Oct. 7, 2010), *available at*

[http://www.waterboards.ca.gov/centralvalley/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/oct2010\\_staffupdate\\_ammonia.pdf](http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/ambient_ammonia_concentrations/oct2010_staffupdate_ammonia.pdf).

<sup>118</sup> ADAM BALLARD ET AL., INTERAGENCY ECOLOGICAL PROGRAM, BACKGROUND/SUMMARY OF AMMONIA INVESTIGATIONS IN THE SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN BAY (2009), *available at* [http://science.calwater.ca.gov/pdf/workshops/workshop\\_ammonia\\_bckgrnd\\_paper\\_nh4-nh3\\_030209.pdf](http://science.calwater.ca.gov/pdf/workshops/workshop_ammonia_bckgrnd_paper_nh4-nh3_030209.pdf); August



- 2009 Ammonia Update Memorandum from Christopher Foe, Cal. Reg'l Water Quality Bd. Cent. Valley Region to Jeff Bruns & Sue McConnell, Water Boards (Sept. 24, 2009), *available at* [http://www.waterboards.ca.gov/centralvalley/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/ammonia\\_mem.pdf](http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/ambient_ammonia_concentrations/ammonia_mem.pdf); 2010 Ammonia Update Memorandum from Christopher Foe, *supra* note 117.
- <sup>119</sup> Glibert, *supra* note 48.
- <sup>120</sup> David Fullerton, Metro. Water Dist., Ammonium Concentrations and the Food Chain in Suisun Bay and the Delta, Presented at the Ammonia Summit at the Central Valley Regional Water Quality Control Board (Aug. 18-19, 2009), [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/18aug09\\_ammonia\\_summit/fullerton\\_pres.pdf](http://www.swrcb.ca.gov/rwqcb5/water_issues/delta_water_quality/ambient_ammonia_concentrations/18aug09_ammonia_summit/fullerton_pres.pdf).
- <sup>121</sup> Inge Werner et al., *The Effects of Wastewater Treatment Effluent Associated Contaminants on Delta Smelt*, UNIV. OF CAL. DAVIS AQUATIC TOXICOLOGY LAB. 1, 60 (2008), *available at* [http://www.water.ca.gov/pubs/environment/interagency\\_ecological\\_program/ammonia/the\\_effects\\_of\\_wastewater\\_treatment\\_effluent-associated\\_contaminants\\_on\\_delta\\_smelt.\\_final\\_report/werner\\_delta\\_smelt\\_ammonia\\_final\\_report012809.pdf](http://www.water.ca.gov/pubs/environment/interagency_ecological_program/ammonia/the_effects_of_wastewater_treatment_effluent-associated_contaminants_on_delta_smelt._final_report/werner_delta_smelt_ammonia_final_report012809.pdf); Inge Werner et al., *Acute Toxicity of Ammonia/um and Wastewater Treatment Effluent-Associated Contaminants on Delta Smelt*, UNIV. OF CAL. DAVIS AQUATIC TOXICOLOGY LAB. 1, 63 (2009), *available at* [http://www.science.calwater.ca.gov/pdf/workshops/POD/UCD-ATL\\_FINAL\\_REPORT\\_Delta%20Smelt%20Ammonia\\_2009.pdf](http://www.science.calwater.ca.gov/pdf/workshops/POD/UCD-ATL_FINAL_REPORT_Delta%20Smelt%20Ammonia_2009.pdf); CHRISTOPHER FOE, ADAM BALLARD & STEPHANIE FONG, CENT. VALLEY REG'L WATER QUALITY CONTROL BD., NUTRIENT CONCENTRATIONS AND BIOLOGICAL EFFECTS IN THE SACRAMENTO-SAN JOAQUIN DELTA (July 2010).
- <sup>122</sup> Werner et al., *Acute Toxicity of Ammonia/um and Wastewater Treatment Effluent-Associated Contaminants on Delta Smelt*, *supra* note 121, at 63.
- <sup>123</sup> Foe, Ballard & Fong, *supra* note 121.
- <sup>124</sup> S.J. Teh, Univ. of Cal. Davis, Aquatic Toxicology Program., *Acute Toxicity of Ammonia, Copper, and Pesticides to Key Copepods, Pseudodiaptomus forbesi and Eurytemora affinis*, of the San Francisco Estuary, Presented at the Ammonia Summit at the Central Valley Regional Water Quality Control Board (Aug. 18-19, 2009), [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/18aug09\\_ammonia\\_summit/teh\\_pres.pdf](http://www.swrcb.ca.gov/rwqcb5/water_issues/delta_water_quality/ambient_ammonia_concentrations/18aug09_ammonia_summit/teh_pres.pdf).
- <sup>125</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD, TENTATIVE NPDES PERMIT FOR SACRAMENTO COUNTY REGIONAL SANITATION DISTRICT, REGIONAL WASTEWATER TREATMENT PLANT, ATTACHMENT K (Sept. 3, 2010).
- <sup>126</sup> *Id.*; Teh, *supra* note 124.
- <sup>127</sup> Teh, *supra* note 124; Randall & Tsui, *supra* note 108; F. B. Eddy, *Ammonia in Estuaries and Effects on Fish*, 67 J. OF FISH BIOLOGY 1495, 1495-1513 (2005).
- <sup>128</sup> Jassby, *supra* note 107; Wilkerson et al., *supra* note 116.
- <sup>129</sup> Cloern, *supra* note 49; P.W. Lehman, *The Influence of Climate on Phytoplankton Community Biomass in San Francisco Bay Estuary*, 45 LIMNOLOGY & OCEANOGRAPHY (3) 580, 580-90 (2000).
- <sup>130</sup> Lehman, *supra* note 129; T. Brown, *Phytoplankton Community Composition: The Rise of the Flagellates*, 22 IEP NEWSLETTER (3) 20, 20-27 (2009), *available at* [http://www.water.ca.gov/iep/newsletters/2009/IEPNewsletter\\_Final2SUMMER-Fall2009%20.pdf](http://www.water.ca.gov/iep/newsletters/2009/IEPNewsletter_Final2SUMMER-Fall2009%20.pdf); J. E. Cloern & R. Dufford, *Phytoplankton Community Ecology: Principles Applied in San Francisco Bay*, 258 MARINE ECOLOGY PROGRESS SERIES 11, 11-28 (2005).
- <sup>131</sup> James Orsi, *Food Habits of Several Abundant Zooplankton Species in the Sacramento-San Joaquin Estuary*, IEP TECHNICAL REPORT No. 41 (Feb., 1995).
- <sup>132</sup> *Id.*
- <sup>133</sup> Michael T. Brett & Dorte C. Muller-Navarra, *The Role of Highly Unsaturated Fatty Acids in Aquatic Foodweb Processes*, 38 FRESHWATER BIOLOGY 483, 483-99 (1997).
- <sup>134</sup> Benni Hanson, Peter Koefod Bjornsen & Per Juel Hansen, *The Size Ratio Between Planktonic Predators and their Prey*, 39(2) LIMNOLOGY & OCEANOGRAPHY 395, 395-403 (1994); Tom Fenchel, *Marine Plankton Food Chains*, 19 ANNUAL REVIEW OF ECOLOGY EVOLUTION & SYSTEMATICS 19, 19-38 (1988).
- <sup>135</sup> Glibert, *supra* note 48.
- <sup>136</sup> Gry Mine Berg et al., *Variability in Inorganic and Organic Nitrogen Uptake Associated with Riverine Nutrient Input in the Gulf of Riga, Baltic Sea*, 24 ESTUARIES 204, 204-14 (2001).
- <sup>137</sup> Quay Dortch, *The Interaction Between Ammonium and Nitrate Uptake in Phytoplankton*, 61 MARINE ECOLOGY PROGRESS SERIES 183, 183-201 (1990).

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- <sup>138</sup> Dugdale, Wilkerson, Hogue & Marchi, *supra* note 45; Wilkerson et al., *supra* note 116.
- <sup>139</sup> Lehman, *supra* note 129; Cloern, *supra* note 49.
- <sup>140</sup> P.W. Lehman et al., *Initial Impacts of Microcystis aeruginosa Blooms on the Aquatic Food Web in the San Francisco Estuary*, 637 HYDROBIOLOGIA 229, 229-48 (2010).
- <sup>141</sup> P.W. Lehman, G. Boyer, C. Hall, S. Waller & K. Gehrts, *Distribution and Toxicity of a New Colonial Microcystis aeruginosa Bloom in the San Francisco Bay Estuary, California*, 541 HYDROBIOLOGIA 87, 87-99 (2005).
- <sup>142</sup> C. E. Mioni, Does Ammonia Impact the Distribution of Harmful Algae and Phototoxins in the San Francisco Estuary?, Presented at the Ammonia Summit at the Central Valley Regional Water Quality Control Board (Aug. 18-19, 2009), [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/18aug09\\_ammonia\\_summit/mioni\\_pres.pdf](http://www.swrcb.ca.gov/rwqcb5/water_issues/delta_water_quality/ambient_ammonia_concentrations/18aug09_ammonia_summit/mioni_pres.pdf).
- <sup>143</sup> Lehman, *supra* note 129; Lehman et al., *supra* note 140; P.W. Lehman, G. Boyer, M. Satchwell & S. Waller, *The Influence of Environmental Conditions on the Seasonal Variation of Microcystis Cell Density and Microcystins Concentration in the San Francisco Estuary*, 600 HYDROBIOLOGIA 187, 187-204 (2008).
- <sup>144</sup> SAN FRANCISCO REG'L WATER QUALITY CONTROL BD., WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SAN FRANCISCO BAY BASIN (2006), *available at* [http://www.waterboards.ca.gov/sanfranciscobay/basin\\_planning.shtml](http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml).
- <sup>145</sup> U.S. ENVTL. PROT. AGENCY, *supra* note 107.
- <sup>146</sup> U.S. ENVTL. PROT. AGENCY, *supra* note 109.
- <sup>147</sup> Diana Engle, Larry Walker Assoc., Total Ammonia and Un-ionized Ammonia Concentrations in the Delta: An Examination of Ambient Concentrations and Toxicity Thresholds, Presented at the Ammonia Summit at the Central Valley Regional Water Quality Control Board (Aug. 18-19, 2009), [http://www.swrcb.ca.gov/centralvalley/water\\_issues/delta\\_water\\_quality/ambient\\_ammonia\\_concentrations/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/delta_water_quality/ambient_ammonia_concentrations/index.shtml).
- <sup>148</sup> S Teh, *supra* note 124.
- <sup>149</sup> Werner et al., *The Effects of Wastewater Treatment Effluent Associated Contaminants on Delta Smelt*, *supra* note 121, at 60.
- <sup>150</sup> FOE, BALLARD & FONG, *supra* note 121.
- <sup>151</sup> U.S. ENVTL. PROT. AGENCY, DRAFT 2009 UPDATE AQUATIC LIFE AMBIENT WATER QUALITY CRITERIA FOR AMMONIA – FRESHWATER FACTSHEET (2009), *available at* <http://www.epa.gov/waterscience/criteria/ammonia/factsheet2.html>.
- <sup>152</sup> FOE, BALLARD & FONG, *supra* note 121.
- <sup>153</sup> Letter from Walter Wadlow, Gen. Manager, Alameda County Water Dist. et al., to Kathleen Harder, Water Res. Control Eng'r, Cal. Reg'l Water Quality Control Bd., Cent. Valley Region, (June 1, 2010), *available at* [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/tentative\\_orders/aquatictox/wateragencies\\_aqtox\\_com.pdf](http://www.swrcb.ca.gov/centralvalley/board_decisions/tentative_orders/aquatictox/wateragencies_aqtox_com.pdf) (regarding aquatic life and wildlife preservation issues concerning Sacramento Regional Wastewater Treatment Plant NPDES Permit Renewal).
- <sup>154</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., NPDES PERMIT RENEWAL ISSUES AQUATIC LIFE AND WILDLIFE PRESERVATION SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT (Apr. 28, 2010), *available at* [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/tentative\\_orders/aquatictox/aquatictox\\_iss\\_pap.pdf](http://www.swrcb.ca.gov/centralvalley/board_decisions/tentative_orders/aquatictox/aquatictox_iss_pap.pdf).
- <sup>155</sup> Central Valley Regional Water Quality Control Board, Adopted Orders, [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/index.shtml](http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/index.shtml) (last visited Dec. 3, 2010) (All data come from these NPDES permits)
- <sup>156</sup> Sacramento County Regional Sanitation District, Regional Wastewater Treatment Plant, NPDES Permit Order No. R5-2010-0014 (Dec. 9, 2010), *available at* [http://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/sacramento/r5-2010-0114\\_npdes.pdf](http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2010-0114_npdes.pdf).
- <sup>157</sup> Stockton NPDES Permit, Order No. R5-2002-0083 (2002).
- <sup>158</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., WASTE DISCHARGE REQUIREMENTS AND NPDES PERMIT FOR THE CITY OF STOCKTON WASTEWATER TREATMENT CONTROL FACILITY NPDES PERMIT R5-2008-0154 (Oct. 23, 2008), *available at* [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/san\\_joaquin/r5-2008-0154.pdf](http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/san_joaquin/r5-2008-0154.pdf).
- <sup>159</sup> FOE, BALLARD & FONG, *supra* note 121.

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<sup>160</sup> The term bioaccumulation is used in this context to refer both to biomagnification (increasing concentration in a food web through trophic transfer) and bioaccumulation (build-up in an organism over time).

<sup>161</sup> A. Dennis Lemly, *Environmental Implications of Excessive Selenium*, 10 BIOMEDICAL & ENVTL. SCIENCES 415, 415 (1997).

<sup>162</sup> A. Robin Stewart et al., *Food Web Pathway Determines How Selenium Affects Ecosystems: A San Francisco Bay Case Study*, 38 ENVTL. SCI. TECH. 4519, 4519-26 (2004).

<sup>163</sup> PETER M. CHAPMAN ET AL., ECOLOGICAL ASSESSMENT OF SELENIUM IN THE AQUATIC ENVIRONMENT 5 (2010) (Evidence has been mounting for several decades); See U.S. FISH & WILDLIFE SERV./ NAT'L MARINE FISHERIES SERV. BIOLOGICAL OPINION ON THE CALIFORNIA TOXICS RULE 123 (2000) (concluded that "[N]early every major review of experimental and field data conducted over the past decade has concluded that a chronic criterion of 5 micrograms/L is not fully protective of aquatic life" and that there was an "overwhelming" weight of evidence supporting a concentration no greater than 2 microg./L); California Toxics Rule, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, 40 C.F.R. § 131.38 (May 18, 2000).

<sup>164</sup> Selenium toxicity is more a concern with wildlife and aquatic life, rather than human health. However, there are regulatory measures to protect humans. As with fish and wildlife, human exposure to selenium occurs through food and to a lesser degree, drinking water. Human health requirements (infants to adults: 15-55 micrograms/L) are generally met without supplements. Inadvertent human exposure to excessive amounts of selenium is unlikely, except through consumption of contaminated fish or meat. See PESTICIDE & ENVTL. TOXICOLOGY BRANCH, OFFICE OF ENVTL. HEALTH HAZARD ASSESSMENT, PUBLIC HEALTH GOAL FOR SELENIUM IN DRINKING WATER (Apr. 2010) (OEHHA has developed a fish contaminant goal for selenium and advisory levels for selenium in fish tissue. OEHHA also is responsible for issuing consumption warnings for sport or subsistence fishing sites where there is evidence of contaminated fish. At present there are no consumption warnings for selenium in the Bay Delta Estuary watershed. The drinking water standard, or "maximum contamination level" (MCL), established by the California Department of Public Health for public water systems is 50 parts per billion (ppb) for selenium. This value may be reevaluated on the basis of recent OEHHA research on human health risk that recommends a 30 ppb goal).

<sup>165</sup> Under highly anoxic conditions (for example, buried sediments) selenium can be reduced to elemental selenium, but selenium does not readily return to elemental form after conversion to bioavailable forms.

<sup>166</sup> Andrew N. Cohen, Guide to the Exotic Species of San Francisco Bay (2005), <http://www.exoticguide.org> (last visited Nov. 4, 2010).

<sup>167</sup> WILLIAM N. BECKON & THOMAS C. MAURER, U.S. DEP'T OF THE INTERIOR, FISH & WILDLIFE SERVICE, SPECIES AT RISK FROM SELENIUM EXPOSURE IN THE SAN FRANCISCO ESTUARY, 1, 51-52 (Mar. 2008) (Beckon and Maurer report that little is known of risk of selenium to green sturgeon).

<sup>168</sup> WILLIAM N. BECKON & THOMAS C. MAURER, POTENTIAL EFFECTS OF SELENIUM CONTAMINATION ON FEDERALLY-LISTED SPECIES RESULTING FROM DELIVERY OF FEDERAL WATER TO THE SAN LUIS UNIT (Mar. 2008), available at [http://www.wrcamnl.wr.usgs.gov/Selenium/Library\\_articles/Beckon\\_and\\_Maurer\\_Effects\\_of\\_Se\\_on\\_Listed\\_Species\\_SLD\\_2008.pdf](http://www.wrcamnl.wr.usgs.gov/Selenium/Library_articles/Beckon_and_Maurer_Effects_of_Se_on_Listed_Species_SLD_2008.pdf).

<sup>169</sup> SAN FRANCISCO ESTUARY INSTITUTE FOR THE GRASSLAND BYPASS PROJECT OVERSIGHT COMMITTEE, GRASSLAND BYPASS PROJECT ANNUAL REPORT 2006-2007 14 (2010), available at [http://www.sfei.org/sites/default/files/GBP%20Annual%20Report%200607%20for%20web\\_1.pdf](http://www.sfei.org/sites/default/files/GBP%20Annual%20Report%200607%20for%20web_1.pdf) (Loading from the Grassland Bypass Project was over 8,000 lbs/year between 1986-96 (pre-project), compared with 3,300/year a decade into the Project (2005-07). Subsequently, loads have continued to decline, but at a slower rate); SAN FRANCISCO BAY REG'L WATER QUALITY CONTROL BD., TECHNICAL MEMORANDUM 2: NORTH BAY SELENIUM DATA SUMMARY AND SOURCE ANALYSIS 3-29 (July 2008), available at [http://www.swrcb.ca.gov/rwqcb2/water\\_issues/programs/TMDLs/northsfbayselenium/TMDL\\_TM2\\_July2008.pdf](http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/TMDLs/northsfbayselenium/TMDL_TM2_July2008.pdf) (The refinery discharges have also shifted from selenite to selenate (the less bioavailable form)).

<sup>170</sup> *Id.*

<sup>171</sup> National Toxics Rule, 40 C.F.R. § 131.36 (Dec. 22, 1992); California Toxics Rule, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, 40 C.F.R. § 131.38 (May 18, 2000) (On May 18, 2000, the EPA promulgated numeric water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to waters in the State of California. The rule filled a gap in California water quality standards that was created in 1994 when a state court overturned the state's water quality control plans containing water quality criteria for priority toxic pollutants. The criteria became legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the Clean Water Act).

<sup>172</sup> California Toxics Rule, 40 C.F.R. § 131.38 (May 18, 2000); National Toxics Rule, 40 C.F.R. § 131.36 (Dec. 22, 1992).

<sup>173</sup> See CENT. VALLEY REG'L WATER QUALITY CONTROL BD., STAFF REPORT: TMDL FOR SELENIUM IN THE LOWER SAN JOAQUIN RIVER 1, 2-3 (Aug. 2001) (In 1996 the Central Valley RWQCB adopted the 5 micrograms/L chronic value, incorporating it into the Basin Plan. This objective still applies to Mud Slough and the San Joaquin River from Sack Dam to Vernalis. This action also set a 2 micrograms/L chronic value for the Grasslands channels and Salt Slough); See CENT. VALLEY REG'L WATER QUALITY CONTROL BD., 1996 BASIN PLAN AMENDMENT (1996), available at

[http://www.swrcb.ca.gov/rwqcb5/water\\_issues/water\\_quality\\_studies/surface\\_water\\_ambient\\_monitoring/historic\\_reports\\_and\\_faq\\_sheets/index.shtml#1996bpa](http://www.swrcb.ca.gov/rwqcb5/water_issues/water_quality_studies/surface_water_ambient_monitoring/historic_reports_and_faq_sheets/index.shtml#1996bpa) (The site-specific objectives adopted by the Regional Board for the Grasslands Marshes and Salt Slough were based in part on consideration of the lentic conditions, but this approach has not been applied consistently throughout the watershed).

<sup>174</sup> U.S. FISH & WILDLIFE SERV., *supra* note 163 (The Services found that "the chronic aquatic life criterion for selenium proposed in the CTR does not protect listed fish and wildlife dependent on the aquatic ecosystem for development and/or foraging").

<sup>175</sup> THERESA S. PRESSER & SAMUEL N. LUOMA, FORECASTING SELENIUM DISCHARGES TO THE SAN FRANCISCO BAY-DELTA ESTUARY, U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 1646, 55, 55-63 (2006), available at <http://pubs.usgs.gov/pp/p1646>.

<sup>176</sup> Theresa Presser & Samuel N. Luoma, *A Methodology for Ecosystem-Scale Modeling of Selenium*, 6 INTEGRATED ENVTL. ASSESSMENT & MGMT. 685, 685-710 (2010), available at <http://onlinelibrary.wiley.com/doi/10.1002/ieam.101/abstract>.

<sup>177</sup> AMY E. KLECKNER ET AL., U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT 2010-1252, SELENIUM CONCENTRATIONS AND STABLE ISOTOPIC COMPOSITIONS OF CARBON AND NITROGEN IN THE BENTHIC CLAM CORBULA AMURENSIS FROM NORTHERN SAN FRANCISCO BAY, CALIFORNIA: MAY 1995-FEBRUARY 2010 (2010), available at <http://pubs.usgs.gov/of/2010/1252/>.

<sup>178</sup> Presser & Luoma, *supra* note 176 at 685-710 (This work is pursuant to two agreements reached following an Endangered Species Act consultation and Biological Opinion on the California Toxics Rule; U.S. EPA agreed to develop and promulgate as part of the California Toxics Rule aquatic life criteria for listed species).

<sup>179</sup> STATE WATER RES. CONTROL BD., *supra* note 93.

<sup>180</sup> STATE WATER RES. CONTROL BD., WATER QUALITY CONTROL POLICY FOR DEVELOPING CALIFORNIA'S CLEAN WATER ACT SECTION 303(D) LIST (Sept. 2004), available at [http://www.swrcb.ca.gov/water\\_issues/programs/tmdl/docs/ffed\\_303d\\_listingpolicy093004.pdf](http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf).

<sup>181</sup> STATE WATER RES. CONTROL BD., *supra* note 93; See Letter from Alexis Strauss, *supra* note 93.

<sup>182</sup> The permits are: Chevron Products Company, Richmond Refinery, CA0005134 (expires 6/13/2011); ConocoPhillips, San Francisco Refinery, CA0005053 (expires 6/15/2011); Shell Oil U.S. and Equilon Enterprises LLC, Shell Martinez Refinery, CA0005789 (expires 10/31/2011); Tesoro Refining and Marketing Co., Golden Eagle Refinery, CA0004961 (expires 6/30/2015); and Valero Refining Company, CA, Valero Benicia Refinery, CA0005550 (expires 11/31/2014).

<sup>183</sup> SAN FRANCISCO BAY REG'L WATER QUALITY CONTROL BD., *supra* note 169, at 3-61.

<sup>184</sup> San Francisco Bay Regional Water Quality Control Board, Amendment of Waste Discharge Requirements for San Francisco Bay Region Refineries, Order No. R2-2010-0057 (2010).

<sup>185</sup> U.S. BUREAU OF RECLAMATION, SAN LUIS UNIT DRAINAGE FEATURE RE-EVALUATION, FINAL ENVIRONMENTAL IMPACT STATEMENT & RECORD OF DECISION 7 (Mar. 2007).

<sup>186</sup> In this area a strict distinction between surface and groundwater, or focus only on surface water, is misplaced. Water management in the Basin mixes both sources. Also, there is evidence that subsurface flow from areas that do not discharge to surface waters may affect the shallow groundwater in areas near the San Joaquin River, where surface-groundwater interchange is active.

<sup>187</sup> U.S. EPA List of Approved Selenium TMDLs,

[http://oaspub.epa.gov/tmdl/waters\\_list.tmdls?region=9&polid=20&pollutant=SELENIUM](http://oaspub.epa.gov/tmdl/waters_list.tmdls?region=9&polid=20&pollutant=SELENIUM) (last visited Nov. 4, 2010) (includes TMDLs for Selenium in the Lower San Joaquin River (2002), Grasslands Marshes (2000), and Salt Slough (1999)); See also Central Valley Regional Water Quality Control Board, San Joaquin River Selenium TMDL, [http://www.swrcb.ca.gov/rwqcb5/water\\_issues/tmdl/central\\_valley\\_projects/san\\_joaquin\\_se/index.shtml](http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_se/index.shtml) (last visited Nov. 4, 2010).

<sup>188</sup> In the future, this current framework may be augmented by, or coordinated more closely with, related programs. One example is tracking with the Irrigated Lands Regulatory Program, which has recently proposed significant

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changes in program scope and approach, including covering discharges to groundwater. The Grasslands Bypass Project area has not been required to participate directly in the ILRP because the Grasslands Bypass Project is considered generally equivalent to the ILRP requirements. Closer ties are also anticipated between the Grasslands Bypass Project and the Long Term Sustainability Initiative (CV-SALTS) to develop a comprehensive regional salt management plan.

<sup>189</sup> The Use Agreement sets out an incentive fee structure to promote compliance with target load reductions and defines multi-agency oversight (in which EPA participates) and technical groups. The Grasslands Bypass Project also has a relatively comprehensive surface water monitoring program with results posted at <http://www.sfei.org/gbp> (last visited Nov. 16, 2010).

<sup>190</sup> SAN FRANCISCO ESTUARY INSTITUTE FOR THE GRASSLAND BYPASS PROJECT OVERSIGHT COMMITTEE, *supra* note 169 (To some extent, the drainers can avoid discharges of selenium to surface waters by storing or placing it elsewhere—notably in shallow groundwater of reuse areas and in uses such as road wetting (termed ‘displacement’ in the Grasslands Report). Reduction in drainage volume in reuse areas facilitates use of this ‘storage’ in lieu of surface discharges, but can concentrate selenium).

<sup>191</sup> CENT. VALLEY REG’L WATER QUALITY CONTROL BD., AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO ADDRESS SELENIUM CONTROL IN THE SAN JOAQUIN RIVER BASIN FINAL STAFF REPORT 6 (May 2010).

<sup>192</sup> In May 2010, the Central Valley Regional Water Quality Control Board gave its approval for extended time through a Basin Plan Amendment; the State Board approved it on October 5, 2010. The action will be followed by revised waste discharge requirements.

<sup>193</sup> PRESSER & LUOMA, *supra* note 175 at 20 (This selenium reservoir is such that increased applied irrigation water does not dilute selenium concentration; rather, concentration increases).

<sup>194</sup> Analysis of San Joaquin Basin selenium has a long history. See U.S. DEP’T OF THE INTERIOR & CAL. RES. AGENCY, A MANAGEMENT PLAN FOR AGRICULTURAL SUBSURFACE DRAINAGE AND RELATED PROBLEMS ON THE WESTSIDE SAN JOAQUIN VALLEY (Sept. 1990); U.S. BUREAU OF RECLAMATION, *supra* note 185; San Joaquin Valley Drainage Documents, <http://www.archive.org/search.php?query=San%20Joaquin%20Valley%20Drainage> (last visited Oct. 21, 2010); Kesterson Reservoir Documents, <http://www.archive.org/search.php?query=kesterson> (last visited Oct. 21, 2010).

<sup>195</sup> U.S. EPA, About Pesticides, [www.epa.gov/pesticides/about/index.htm](http://www.epa.gov/pesticides/about/index.htm) (last visited Oct. 21, 2010).

<sup>196</sup> U.S. GEOLOGICAL SURVEY, PESTICIDES IN SURFACE AND GROUND WATER OF THE UNITED STATES: SUMMARY OF THE RESULTS OF THE NATIONAL WATER QUALITY ASSESSMENT PROGRAM (NAWQA) (2006), *available at* <http://pubs.usgs.gov/circ/2005/1291>.

<sup>197</sup> STATE WATER RES. CONTROL BD., *supra* note 93.

<sup>198</sup> CHRISTOPHER FOE & VALERIE CONNOR, STAFF REPORT CENT. VALLEY REG’L WATER QUALITY CONTROL BD., 1989 RICE SEASON TOXICITY MONITORING RESULTS (1991), *available at* [http://www.calwater.ca.gov/Admin\\_Record/C-029766.pdf](http://www.calwater.ca.gov/Admin_Record/C-029766.pdf).

<sup>199</sup> CHRISTOPHER FOE & VALERIE CONNOR, STAFF REPORT CENT. VALLEY REG’L WATER QUALITY CONTROL BD., SAN JOAQUIN WATERSHED BIOASSAY RESULTS, 1988-1990 (1991).

<sup>200</sup> Kathryn Kuivila & Christopher Foe, *Concentrations, Transport and Biological Effects of Dormant Spray Pesticides in the San Francisco Estuary, California*, 14 ENVTL. TOXICOLOGY & CHEMISTRY 1141, 1141-50 (1995).

<sup>201</sup> Howard C. Bailey et al., *Diazinon and Chlorpyrifos in Urban Waterways in Northern California, USA*, 19 ENVTL. TOXICOLOGY & CHEMISTRY 82, 82-87 (2000); VALERIE CONNOR, STAFF MEMORANDUM STATUS OF URBAN STORM RUNOFF PRODUCTS, ALGAL TOXICITY AND HERBICIDE LEVELS ASSOCIATED WITH URBAN STORM RUNOFF, DIAZINON AND CHLORPYRIFOS DETECTIONS IN THE SAN FRANCISCO BAY AREA, *as reported in* CHRISTOPHER FOE, STAFF REPORT CENT. VALLEY REG’L WATER QUALITY CONTROL BD., EVALUATION OF THE POTENTIAL IMPACT OF CONTAMINANTS ON AQUATIC RESOURCES IN THE CENTRAL VALLEY AND SACRAMENTO-SAN JOAQUIN DELTA ESTUARY (1995).

<sup>202</sup> CHRISTOPHER FOE, LINDA DEANOVIC & DAVE HINTON, STAFF REPORT CENT. VALLEY REG’L WATER QUALITY CONTROL BD. TOXICITY IDENTIFICATION EVALUATIONS OF ORCHARD DORMANT SPRAY RUNOFF (1998).

<sup>203</sup> CHRISTOPHER FOE & R. SHEIPLINE, STAFF REPORT CENT. VALLEY REG’L WATER QUALITY CONTROL BD., PESTICIDES IN SURFACE WATER FROM APPLICATIONS ON ORCHARDS AND ALFALFA DURING THE WINTER AND SPRING OF 1991-1992 (1993).

<sup>204</sup> Donald Weston & Michael J. Lydy, *Pyrethroid Insecticides to the Sacramento-San Joaquin Delta of California*, 44 ENVTL. SCI. & TECH. 1833, 1833-40 (2010).

<sup>205</sup> STATE WATER RES. CONTROL BD., *supra* note 93.

- <sup>206</sup> *Id.*
- <sup>207</sup> “Unknown toxicity” is an impairment category that documents toxic events (widespread aquatic organism mortality in one location) that results from unidentified contaminants and their unidentified sources.
- <sup>208</sup> FOE & CONNOR, *supra* note 199; FOE & SHEPLINE, *supra* note 203; Weston & Lydy, *supra* note 204.
- <sup>209</sup> URBAN PESTICIDE POLLUTION PREVENTION PROJECT, PESTICIDES OF INTEREST FOR URBAN SURFACE WATER QUALITY, URBAN PESTICIDES USE TRENDS ANNUAL REPORT (2008), *available at* <http://www.up3project.org/documents/UP3UseTrendsReport2008.pdf>.
- <sup>210</sup> Including the Sacramento and San Joaquin River Basins, Bay Delta Estuary, and San Francisco Bay watersheds.
- <sup>211</sup> Reported for pesticides applied in amounts greater than 500 kg (0.5 tons or ~1100 pounds).
- <sup>212</sup> Kathryn Kuivila & Michelle Hladik, *Understanding the Occurrence and Transport of Current-Use Pesticides in the San Francisco Estuary Watershed*, 6(3) SAN FRANCISCO ESTUARY & WATERSHED SCI. 1, 1-19 (2008).
- <sup>213</sup> URBAN PESTICIDE POLLUTION PREVENTION PROJECT, *supra* note 209.
- <sup>214</sup> JOHNSON, *supra* note 103; Nathaniel Schloz, *Pesticides and the Decline of Pelagic Fishes in Western North America's Largest Estuarine Ecosystem* CONSERVATION LETTERS (forthcoming 2011); NATIONAL RESEARCH COUNCIL, COMMITTEE ON SUSTAINABLE WATER AND ENVIRONMENTAL MANAGEMENT IN THE CALIFORNIA BAY-DELTA, A SCIENTIFIC ASSESSMENT OF ALTERNATIVES FOR REDUCING WATER MANAGEMENT EFFECTS ON THREATENED AND ENDANGERED FISHES IN CALIFORNIA'S BAY DELTA (2010), *available at* [http://www.nap.edu/catalog.php?record\\_id=12881](http://www.nap.edu/catalog.php?record_id=12881).
- <sup>215</sup> Kuivila & Moon, *supra* note 43.
- <sup>216</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO AND SAN JOAQUIN RIVER BASINS (2009), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/basin\\_plans/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/basin_plans/index.shtml).
- <sup>217</sup> Inge Werner et al., *Insecticide-Caused Toxicity to Ceriodaphnia dubia (Cladocera) in the Sacramento–San Joaquin River Delta, California, USA*, 19 ENVTL. TOXICOLOGY & CHEMISTRY 215, 215-27 (2000); Kuivila & Moon, *supra* note 43.
- <sup>218</sup> Kuivila & Moon, *supra* note 43.
- <sup>219</sup> Bennett, *supra* note 37.
- <sup>220</sup> David Ostrach et al., *Maternal Transfer of Xenobiotics and Effects on Larval Striped Bass in the San Francisco Estuary*, 105 PROCEEDINGS OF THE NAT'L ACAD. OF SCI. 19354, 19354-59 (2008).
- <sup>221</sup> DANIEL OROS & INGE WERNER, WHITE PAPER FOR THE INTERAGENCY ECOLOGICAL PROGRAM, SFEI CONTRIBUTION 415, PYRETHROID INSECTICIDES: AN ANALYSIS OF USE PATTERNS, DISTRIBUTIONS, POTENTIAL TOXICITY AND FATE IN THE SACRAMENTO-SAN JOAQUIN DELTA AND CENTRAL VALLEY (2005), *available at* [http://www.science.calwater.ca.gov/pdf/workshops/POD/CDFG\\_POD\\_Pyrethroids\\_White\\_Paper\\_Final\\_PDF.pdf](http://www.science.calwater.ca.gov/pdf/workshops/POD/CDFG_POD_Pyrethroids_White_Paper_Final_PDF.pdf).
- <sup>222</sup> PETER MOYLE, INLAND FISHES OF CALIFORNIA 405 (1976) *as reported in* OROS & WERNER, *supra* note 221.
- <sup>223</sup> S. OBREBSKI, J.J. ORSI & W. KIMMERER, IEP TECHNICAL REPORT NO. 32, LONG TERM TRENDS IN ZOOPLANKTON DISTRIBUTION AND ABUNDANCE IN THE SACRAMENTO-SAN JOAQUIN ESTUARY (1992).
- <sup>224</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., DELTA DIAZINON AND CHLORPYRIFOS TMDL-FINAL BASIN PLAN AMENDMENT STAFF REPORT (June 2006), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/delta\\_op\\_pesticide/final\\_staff\\_report/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_op_pesticide/final_staff_report/index.shtml); OROS & WERNER, *supra* note 221.
- <sup>225</sup> STATE WATER RES. CONTROL BD., *supra* note 93.
- <sup>226</sup> URBAN PESTICIDE POLLUTION PREVENTION PROJECT, *supra* note 209.
- <sup>227</sup> OROS & WERNER, *supra* note 221.
- <sup>228</sup> Kuivila & Hladik, *supra* note 212.
- <sup>229</sup> Bailey et al., *supra* note 201; Howard Bailey et al., *Joint Acute Toxicity of Diazinon and Chlorpyrifos to Ceriodaphnia dubia*, 16 ENVTL. TOXICOLOGY & CHEMISTRY 2304, 2304-08 (1997); Michael Lydy & K. R. Austin, *Toxicity Assessment of Pesticide Mixtures Typical of the Sacramento–San Joaquin Delta using Chironomus tentans*, 48 ARCHIVES OF ENVTL. CONTAMINATION & TOXICOLOGY 49, 49–55 (2004).
- <sup>230</sup> M. Faust et al., *Additive Effects of Herbicide Combinations on Aquatic Non-Target Organisms*, 134 SCI. OF THE TOTAL ENV'T (Supplement 2) 941, 941-52 (1993).
- <sup>231</sup> Teresa Norberg-King et al., *Application of Toxicity Identification Evaluation Procedures to the Ambient Waters of the Colusa Basin Drain, California*, 10 ENVTL. TOXICOLOGY & CHEMISTRY 891, 891-900 (1991).
- <sup>232</sup> Debra Denton et al., *Joint Acute Toxicity of Esfenvalerate and Diazinon to Larval Fathead Minnows (Pimephales promelas)*, 22 ENVTL. TOXICOLOGY & CHEMISTRY 336, 336-41 (2003).
- <sup>233</sup> Lydy & Austin, *supra* note 229.

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<sup>234</sup> OROS & WERNER, *supra* note 221.

<sup>235</sup> URBAN PESTICIDE POLLUTION PREVENTION PROJECT, *supra* note 209.

<sup>236</sup> Kuivila & Hladik, *supra* note 212.

<sup>237</sup> ZHIMIN LU & GENE DAVIS, CENT. VALLEY REG'L WATER QUALITY CONTROL BD. STAFF REPORT, RELATIVE-RISK EVALUATION FOR PESTICIDES USED IN THE CENTRAL VALLEY PESTICIDES BASIN PLAN AMENDMENT PROJECT AREA (2010), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_pesticides/risk\\_evaluation/rre\\_stff\\_rpt\\_feb2009\\_final.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/risk_evaluation/rre_stff_rpt_feb2009_final.pdf).

<sup>238</sup> Weston & Lydy, *supra* note 204; Ostrach et al., *supra* note 220.

<sup>239</sup> Schloz, *supra* note 214; Michael J. Lydy et al., *Challenges in Regulating Pesticide Mixtures*, 9 ECOLOGY & SOC'Y (6) 1, 1-15 (2004), *available at* <http://www.ecologyandsociety.org/vol9/iss6/art1>.

<sup>240</sup> Wash. Toxics Coal. v. E.P.A., No. C-01-0132C (W.D. Wash. Jan. 22, 2004).

<sup>241</sup> National Marine Fisheries Services, Pesticide Consultations with U.S. EPA, <http://www.nmfs.noaa.gov/pr/consultation/pesticides.htm> (last visited Dec. 21, 2010) (Contains links to three NMFS biological opinions spanning from 2008-2010 on 18 active ingredients, as well as consultation correspondence. These cases and consultations are very active, with related court filings and agency exchanges occurring regularly. The next two sets of NMFS biological opinions (on carbaryl, carbofuran and methomyl (2008), and on azinphos methyl, bensulide, dimethoate, disulfoton, ethoprop, fenamiphos, laled, mathamidophos, methyl parathion, phorate and phosmet (2010) have also been issued); U.S. EPA, Pesticides: Endangered Species Protection Program, <http://www.epa.gov/espp/> (last visited Jan. 7, 2011) (An updated status of the litigation, consultations, and current pesticide restrictions, along with links to the relevant administrative and court documents).

<sup>242</sup> U.S. EPA, *supra* note 241 (use restrictions and other documents associated with this consultation process).

<sup>243</sup> These cases and consultations are very active, with related court filings and agency exchanges occurring regularly. An updated status of the litigation, consultations, and current pesticide restrictions, along with links to the relevant administrative and court documents, is available at <http://www.epa.gov/espp/>.

<sup>244</sup> Ctr. for Biological Diversity v. EPA, No. 07-2794-JCS (N.D. Cal. May 17, 2010) (stipulated injunction), *available at* <http://www.epa.gov/espp/litstatus/stipulated-injuc.html>.

<sup>245</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., *supra* note 216.

<sup>246</sup> SAN FRANCISCO REG'L WATER QUALITY CONTROL BD., SAN FRANCISCO BAY BASIN WATER QUALITY CONTROL PLAN (2007), *available at* [http://www.swrcb.ca.gov/sanfranciscobay/water\\_issues/programs/basin\\_plan/docs/basin\\_plan07.pdf](http://www.swrcb.ca.gov/sanfranciscobay/water_issues/programs/basin_plan/docs/basin_plan07.pdf).

<sup>247</sup> STATE WATER RES. CONTROL BD., *supra* note 60.

<sup>248</sup> STATE WATER RES. CONTROL BD., DRAFT POLICY FOR TOXICITY ASSESSMENT AND CONTROL (2010), *available at* [http://www.waterboards.ca.gov/water\\_issues/programs/state\\_implementation\\_policy/docs/tox\\_policy.pdf](http://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/tox_policy.pdf).

<sup>249</sup> STATE WATER RES. CONTROL BD., DRAFT STAFF REPORT POLICY FOR TOXICITY ASSESSMENT AND CONTROL (2010), *available at* [http://www.waterboards.ca.gov/water\\_issues/programs/state\\_implementation\\_policy/docs/stff\\_rpt\\_tox\\_policy.pdf](http://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/stff_rpt_tox_policy.pdf).

<sup>250</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., *supra* note 216.

<sup>251</sup> *Id.*

<sup>252</sup> *Id.*

<sup>253</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., SACRAMENTO AND SAN JOAQUIN RIVER WATERSHEDS PESTICIDE BASIN PLAN AMENDMENT FACT SHEET (2006), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_pesticides/att2\\_fact.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/att2_fact.pdf).

<sup>254</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., RELATIVE-RISK EVALUATION FOR PESTICIDES USED IN THE CENTRAL VALLEY PESTICIDE BASIN PLAN AMENDMENT PROJECT AREA (Feb. 2009), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_pesticides/risk\\_evaluation/rre\\_stff\\_rpt\\_feb2009\\_final.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/risk_evaluation/rre_stff_rpt_feb2009_final.pdf).

<sup>255</sup> Central Valley Regional Water Quality Control Board, Central Valley Pesticide TMDL and Basin Plan Amendment - Water Quality Criteria Method Development, [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_pesticides/criteria\\_method/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/criteria_method/index.shtml) (last visited Nov. 4, 2010).

<sup>256</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., CENTRAL VALLEY PESTICIDE TMDL AND BASIN PLAN AMENDMENT - JULY 2010 PROJECT STATUS UPDATE (2010), *available at*

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[http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_pesticides/pest\\_bpa\\_status\\_jul2010.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/pest_bpa_status_jul2010.pdf).

<sup>257</sup> STATE WATER RES. CONTROL BD., *supra* note 93.

<sup>258</sup> Letter from Fred Kizito, Env'tl. Sci., Cent. Valley Reg'l Water Quality Control Bd., to interested parties (May 11, 2009) (Supplemental Information to the Notice of Public Workshop/CEQA Scoping Meeting for a Proposed Basin Plan Amendment to Address OC Pesticides in Several Central Valley Waterbodies), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/central\\_valley\\_organochlorine\\_pesticide/2009jul07\\_ceqa\\_scoping\\_mtg/oc\\_ceqa\\_supscoping.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_organochlorine_pesticide/2009jul07_ceqa_scoping_mtg/oc_ceqa_supscoping.pdf).

<sup>259</sup> Central Valley Regional Water Quality Control Board, Conditional Waivers of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region, Resolution No. R5-2005-107 (2005), *available at* [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/waivers/r5-2005-0107.pdf](http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2005-0107.pdf).

<sup>260</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., DRAFT ENVIRONMENTAL IMPACT REPORT IRRIGATED LANDS REGULATORY PROGRAM (2010), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/irrigated\\_lands/long\\_term\\_program\\_development/draft\\_program\\_eir\\_july2010/peir\\_exec\\_summ.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/irrigated_lands/long_term_program_development/draft_program_eir_july2010/peir_exec_summ.pdf).

<sup>261</sup> Central Valley Regional Water Quality Control Board, Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands, Order No. R5-2006-0053 (2006), *available at* [http://www.swrcb.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/waivers/r5-2006-0053\\_24apr08\\_amend.pdf](http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2006-0053_24apr08_amend.pdf).

<sup>262</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., DRAFT ENVIRONMENTAL IMPACT STATEMENT IRRIGATED LANDS REGULATORY PROGRAM (2010), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/irrigated\\_lands/long\\_term\\_program\\_development/draft\\_program\\_eir\\_july2010/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/irrigated_lands/long_term_program_development/draft_program_eir_july2010/index.shtml).

<sup>263</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., LONG TERM ILRP DEVELOPMENT SUMMARY (Sept. 2010), *available at* [http://www.swrcb.ca.gov/centralvalley/water\\_issues/irrigated\\_lands/long\\_term\\_program\\_development/sept2010\\_public\\_workshops/ilrp\\_handout.pdf](http://www.swrcb.ca.gov/centralvalley/water_issues/irrigated_lands/long_term_program_development/sept2010_public_workshops/ilrp_handout.pdf).

<sup>264</sup> Weston & Lydy, *supra* note 204.

<sup>265</sup> The existing MS4 permits potentially affecting the Bay Delta Estuary, along with their respective service areas and expiration (if any) are: (1) East Contra Costa County MS4 Permit, Order No. 5-00-120 (Sept. 22, 2010) (City of Antioch, City of Brentwood, City of Oakley, Contra Costa County, and Contra Costa County Flood Control and Water Conservation District); (2) Sacramento County MS4 Permit, Order No. R5-2008-0142 (2008) (County of Sacramento and Cities of Citrus Heights, Elk Grove, Folsom, Galt, and Sacramento Stormwater Discharges From Municipal Separate Storm Sewer Systems); (3) City of Stockton/San Joaquin County MS4 Permit (City of Stockton and County of San Joaquin Storm Water Discharges from Municipal Separate Storm Sewer System); (4) Port of Stockton MS4 Permit, Order No. R5-2004-0136 (Expired Oct. 2009) (Stockton Port District); (5) City of Modesto MS4 Permit (City of Modesto); and (6) Fresno MS4 Permit, Order No. 5-00-148 (Expired Mar. 2006) (Fresno County, Fresno Metropolitan Flood Control District, City of Fresno, City of Clovis, and California State University of Fresno). In addition, the State Water Resources Control Board adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ (2003)) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes.

<sup>266</sup> California Construction General Permit, Water Quality Order No. 2009-0009-DWQ (2009).

<sup>267</sup> 40 C.F.R. § 450.21(d)(2) (Feb. 1, 2010) (emphasis added).

<sup>268</sup> See 40 C.F.R. §§ 122.43-44 (Apr. 11, 2007).

<sup>269</sup> California Industrial Stormwater General Permit, Water Quality Order No. 97-03-DWQ (1997).

<sup>270</sup> See 40 C.F.R. § 122.35 (Dec. 8, 1999); 40 C.F.R. § 122.26(a)(9)(i)(C)-(D) (June 12, 2006).

<sup>271</sup> For example, the Lahontan Regional Water Quality Control Board designated all jurisdictional areas of the City of South Lake Tahoe, El Dorado County, and Placer County that fall within the Lake Tahoe Hydrologic Unit as Phase I MS4, even though this area does not meet the population threshold requirements of a Phase I MS4.

<sup>272</sup> U.S. ENVTL. PROT. AGENCY, DRAFT GENERAL PERMIT FOR RESIDUALLY DESIGNATED DISCHARGES IN MILFORD, BELLINGHAM, AND FRANKLIN, MASSACHUSETTS (2010), *available at* <http://www.epa.gov/region1/npdes/charlesriver/index.html> (last visited Nov. 4, 2010) (emphasis added).

<sup>273</sup> See Chesapeake Bay Executive Order, Restoring and Protecting a Natural Treasure, Reports & Documents, <http://executiveorder.chesapeakebay.net/category/Reports-Documents.aspx> (last visited Oct. 27, 2010).

<sup>274</sup> See U.S. EPA, Proposed National Rulemaking to Strengthen the Stormwater Program,



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- <http://cfpub.epa.gov/npdes/stormwater/rulemaking.cfm> (last visited Oct.27, 2010).
- <sup>275</sup> *Headwaters, Inc. v. Talent Irrigation Dist.*, 243 F.3d 526 (9th Cir. 2001).
- <sup>276</sup> Water Quality Order No. 2004-0008-DWQ (2004).
- <sup>277</sup> Water Quality Order No. 2004-0009-DWQ (2004).
- <sup>278</sup> See 71 Fed. Reg. 68,483 (Nov. 27, 2006).
- <sup>279</sup> *Nat'l Cotton Council of America v. EPA*, 553 F.3d 927 (6th Cir. 2009).
- <sup>280</sup> See 75 Fed. Reg. 31,775 (June 4, 2010).
- <sup>281</sup> STATE WATER RES. CONTROL BD., NOTICE OF OPPORTUNITY TO PROVIDE INFORMAL COMMENTS ON PRELIMINARY DRAFT ADULTICIDES PERMIT (Nov. 16, 2009), available at [http://www.swrcb.ca.gov/water\\_issues/programs/npdes/docs/adulticides/111609notice4comment.pdf](http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/adulticides/111609notice4comment.pdf).
- <sup>282</sup> P.J.M. Reijnders & S.M.J.M. Brasseur, *Xenobiotic Induced Hormonal and Associated Development Disorders in Marine Organisms and Related Effects in Human; an Overview*, in CHEMICALLY INDUCED ALTERATIONS IN SEXUAL AND FUNCTIONAL DEVELOPMENT: THE WILDLIFE/HUMAN CONNECTION 159, 159-74 (T. Colborn & C. Clement eds., 1992).
- <sup>283</sup> C.E. Purdom et al., *Estrogenic Effects of Effluents from Sewage Treatment Works*, 8 CHEM. ECOLOGY 275, 275-85 (1994); Susan Jobling et al., *A Variety of Environmentally Persistent Chemicals, including some Phthalate Plasticizers, are Weakly Estrogenic*, 103 ENVTL. HEALTH PERSPECTIVES 582, 582-87 (1995).
- <sup>284</sup> Susan Klosterhaus, San Francisco Estuary Inst., Update on Contaminants of Emerging Concern, Presentation at RMP Annual Meeting (Oct. 5, 2010), available at [www.sfei.org/rmp/2010-Annual-Meeting](http://www.sfei.org/rmp/2010-Annual-Meeting).
- <sup>285</sup> M. SCHAEFER & M.L. JOHNSON, UC DAVIS AQUATIC ECOSYSTEMS ANALYSIS LABORATORY, PHARMACEUTICAL AND PERSONAL CARE PRODUCTS IN SURFACE WATER – OCCURRENCE, FATE AND TRANSPORT, AND EFFECT ON AQUATIC ORGANISMS (Oct. 2009).
- <sup>286</sup> R. Lavado et al., *Site-Specific Profiles of Estrogenic Activity in Agricultural Areas of California's Inland Waters*, 43 ENVTL. SCI. & TECH. 9110, 9110-16 (2009).
- <sup>287</sup> D.G. Joakim Larsson & L. Förlin, *Male-Biased Sex Ratios of Fish Embryos Near a Pulp Mill: Temporary Recovery after a Short-Term Shutdown*, 110 ENVTL. HEALTH PERSPECTIVES 739, 739-42 (2002); Susan Jobling et al., *Predicted Exposures to Steroid Estrogens in U.K. Rivers Correlate with Widespread Sexual Disruption in Wild Fish Populations*, 114 ENVTL. HEALTH PERSPECTIVES (Supplement 1) 32, 32-39 (2006).
- <sup>288</sup> Ted Sommer, Cal. Dep't of Water Res., An Introduction to the Pelagic Organism Decline, Presentation at the 5<sup>th</sup> Biennial CALFED Science Conference (Oct. 22-24, 2008).
- <sup>289</sup> BENNETT, HOBBS & TEH, *supra* note 41.
- <sup>290</sup> *Id.*
- <sup>291</sup> U.S. EPA, Strategy for Addressing Pharmaceuticals and Personal Care Products in Water, <http://water.epa.gov/scitech/swguidance/ppcp/basic.cfm> (last visited Nov. 4, 2010).
- <sup>292</sup> U.S. EPA, Pharmaceuticals and Personal Care Products as Pollutants, <http://www.epa.gov/ppcp/> (last visited Dec. 3, 2010) (EPA is also working to better understand and evaluate potential risks to human health of CECs in drinking water. This is not within the scope of this ANPR).
- <sup>293</sup> U.S. ENVTL. PROT. AGENCY, GUIDELINES FOR DERIVING NUMERICAL NATIONAL WATER QUALITY CRITERIA FOR THE PROTECTION OF AQUATIC ORGANISM AND THEIR USES (1985), available at [http://water.epa.gov/scitech/swguidance/waterquality/standards/current/upload/2009\\_01\\_13\\_criteria\\_85guidelines.pdf](http://water.epa.gov/scitech/swguidance/waterquality/standards/current/upload/2009_01_13_criteria_85guidelines.pdf).
- <sup>294</sup> U.S. ENVTL. PROT. AGENCY, OW/ORD EMERGING CONTAMINANTS WORKGROUP, AQUATIC LIFE CRITERIA FOR CONTAMINANTS OF EMERGING CONCERN: GENERAL CHALLENGES AND RECOMMENDATIONS (June 3, 2008).
- <sup>295</sup> Letter from EPA's Science Advisory Board to EPA (Dec. 18, 2008) (Review of EPA White Paper on Aquatic Life Criteria for Contaminants of Emerging Concern).
- <sup>296</sup> U.S. EPA, Analytical Methods: Contaminants of Emerging Concern, Pharmaceuticals and Personal Care Products (PPCPs) Methods Development, <http://water.epa.gov/scitech/swguidance/methods/ppcp/index.cfm> (last visited Dec. 6, 2010).
- <sup>297</sup> CAL. OCEAN PROT. COUNCIL, CAL. OCEAN SCI. TRUST, NWRI, SAN FRANCISCO ESTUARY INST., S. CAL. COASTAL WATER RES. PROJECT & URBAN WATER RES. CTR. AT THE UNIV. OF CAL., IRVINE, MANAGING CONTAMINANTS OF EMERGING CONCERN IN CALIFORNIA: DEVELOPING PROCESSES FOR PRIORITIZING, MONITORING, AND DETERMINING THRESHOLDS OF CONCERN (Sept. 2009), available at <http://www.sfei.org/node/2838> (based on a workshop held on April 28-29, 2009, in Costa Mesa, California).
- <sup>298</sup> State Water Resources Control Board, Recycled Water – Constituents of Emerging Concern,

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[http://www.waterboards.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/recycledwater\\_cec.shtml](http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/recycledwater_cec.shtml) (last visited Dec. 3, 2010).

<sup>299</sup> STATE WATER RES. CONTROL BD., MONITORING STRATEGIES FOR CHEMICALS OF EMERGING CONCERN (CECs) IN RECYCLED WATER – RECOMMENDATIONS OF A SCIENTIFIC ADVISORY PANEL (June 25, 2010), *available at* [http://www.waterboards.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/docs/cec\\_monitoring\\_rpt.pdf](http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/docs/cec_monitoring_rpt.pdf).

<sup>300</sup> STATE WATER RES. CONTROL BD., CONSTITUENTS OF EMERGING CONCERN (CEC) MONITORING FOR RECYCLED WATER, STAFF REPORT (Nov. 8, 2010), *available at* [http://www.waterboards.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/docs/cec111610/staffreport.pdf](http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/docs/cec111610/staffreport.pdf) (presenting the recommendations for monitoring CECs in municipal recycled water).

<sup>301</sup> Southern California Coastal Water Research Project, Project: Advisory Panel for CECs in Coastal and Marine Ecosystems, <http://www.sccwrp.org/ResearchAreas/Contaminants/ContaminantsOfEmergingConcern/EcosystemsAdvisoryPanel.aspx> (last visited Dec. 3, 2010).

<sup>302</sup> Cloern et al., *supra* note 39.

<sup>303</sup> Alan D. Jassby et al., *Isohaline Position as a Habitat Indicator for Estuarine Populations*, 5 ECOLOGICAL APPLICATIONS 272, 272-89 (1995); SAN FRANCISCO ESTUARY PROJECT, MANAGING FRESHWATER DISCHARGE TO THE SAN FRANCISCO BAY/SACRAMENTO SAN JOAQUIN DELTA ESTUARY: THE SCIENTIFIC BASIS FOR AN ESTUARINE STANDARD, 127 (1993); PRINCIPLES FOR AGREEMENT ON BAY-DELTA STANDARDS BETWEEN THE STATE OF CALIFORNIA AND THE FEDERAL GOVERNMENT (Dec. 12, 1994) (Bay Delta Accord) (The X2 standard evolved out of a series of facilitated workshops involving agency and academic biologists in 1991. These workshops concluded that changes in the salinity gradient were strongly associated with both the distribution of most species in the San Francisco Bay and with the abundance of many species of the upper estuary. As an index of the Estuary's salinity gradient, the workshop used the location of the low salinity zone, where average daily salinity at the bottom was 2 ppt. This index of the salinity gradient was stated in terms of the distance in kilometers from the Golden Gate to the low salinity zone. The workshop coined the term X2 to represent this index. In times of high outflow, the low salinity zone is downstream and X2 is a smaller number. When outflow is reduced, the low salinity zone is further upstream and X2 is a higher number. The group recommended the use of X2 as a management tool. The approach was refined over several years of discussions and was incorporated into the Bay Delta Accord. Consistent with the Bay Delta Accord, the State Board reviewed this approach and adopted a standard based on it as part of the WQCP in 1995).

<sup>304</sup> Thomson et al., *supra* note 48 (Increased water use upstream has increased salinity in the western Delta and Suisun Bay for as long as records exist); THE BAY INST. OF SAN FRANCISCO, FROM THE SIERRA TO THE SEA: AN ECOLOGICAL HISTORY OF THE SAN FRANCISCO BAY DELTA ESTUARY 175 (1998), *available at* <http://www.bay.org/publications/from-the-sierra-to-the-sea-the-ecological-history-of-the-san-francisco-bay-delta-waters> (With the development of major reservoirs in the mid-20<sup>th</sup> century, springtime X2 changed through time in ways that reduced the survival and abundance of desired aquatic organisms); Jassby & Powell, *supra* note 29.

<sup>305</sup> Mac Nally et al., *supra* note 49.

<sup>306</sup> Kimmerer, *supra* note 29.

<sup>307</sup> *Id.* (Not all species relying on low salinity habitat show this statistical relationship between the location of spring X2 and overall abundance. The delta smelt, for example, lives primarily in low salinity habitat for a large part of its life cycle, but shows no consistent pattern in abundance from year to year with springtime values of X2); W.J. Kimmerer, E.S. Gross & M.L. MacWilliams, *Is the Response of Estuarine Nekton to Freshwater Flow in the San Francisco Estuary Explained by Variation in Habitat Volume?*, 32 ESTUARIES & COASTS 375, 375-89 (2009).

<sup>308</sup> Adam Paganini et al., *Metabolic Responses to Environmental Salinity in the Invasive Clam Corbula amurensis*, AQUATIC BIOLOGY (forthcoming 2011).

<sup>309</sup> Jassby & Powell, *supra* note 29.

<sup>310</sup> SAN FRANCISCO ESTUARY PROJECT, MANAGING FRESHWATER DISCHARGE TO THE SAN FRANCISCO BAY/SACRAMENTO SAN JOAQUIN DELTA ESTUARY: THE SCIENTIFIC BASIS FOR AN ESTUARINE STANDARD, 127 (1993); Jassby & Powell, *supra* note 29; STATE WATER RES. CONTROL BD., WATER QUALITY CONTROL PLAN FOR THE SAN FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY (May 1995), *available at* [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/wq\\_control\\_plans/1995wqcp/1995\\_plan.shtml](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/1995wqcp/1995_plan.shtml).

<sup>311</sup> Frederick Feyrer et al., *Modeling the Effects of Future Outflow on the Abiotic Habitat of an Imperiled Estuarine Fish*, ESTUARIES & COASTS (2010), *available at* <http://www.springerlink.com/content/d22u618x244n7j46/fulltext.pdf>.

- <sup>312</sup> WATER RESOURCES DEPARTMENT, CONTRA COSTA WATER DISTRICT, HISTORICAL FRESH WATER AND SALINITY CONDITIONS IN THE WESTERN SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN BAY: A SUMMARY OF HISTORICAL REVIEWS, REPORTS, ANALYSES AND MEASUREMENTS (Feb. 2010), *available at* <http://www.ccwater.com/salinity/HistoricalSalinityReport-2010Feb.pdf>; U.S. FISH & WILDLIFE SERV., 2008 BIOLOGICAL OPINION ON THE PROPOSED COORDINATED OPERATIONS OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT (Dec. 12, 2008), *available at* [http://www.fws.gov/sacramento/es/documents/SWP-CVP\\_OPs\\_BO\\_12-15\\_final\\_OCR.pdf](http://www.fws.gov/sacramento/es/documents/SWP-CVP_OPs_BO_12-15_final_OCR.pdf).
- <sup>313</sup> U.S. FISH & WILDLIFE SERV., *supra* note 312.
- <sup>314</sup> Heather Peterson & M. Vayssières, *Benthic Assemblage Variability in the Upper San Francisco Estuary: a 27-year Retrospective*, 8 SAN FRANCISCO ESTUARY & WATERSHED SCI. 1, 1-27 (2010), *available at* <http://www.escholarship.org/uc/item/4d0616c6>; Janet Thompson, U.S. Geological Survey, Clams, Shrimp, Fish, Birds and Phytoplankton: Causes and Effects of Seasonal and Interannual Variation in Clam Biomass and Grazing in the Northern San Francisco Estuary, Presentation at 2010 Bay Delta Science Conference (2010), *available at* <http://www.baydeltascienceconf.com/>.
- <sup>315</sup> ROBERT SCHROETER, BIOLOGY AND LONG-TERM TRENDS OF ALIEN HYDROMEDUSAE AND STRIPED BASS IN A BRACKISH TIDAL MARSH IN THE SAN FRANCISCO ESTUARY, PH.D. DISSERTATION, UNIV. OF CAL., DAVIS (2008).
- <sup>316</sup> Feyrer, Sommer & Slater, *supra* note 37 **Error! Bookmark not defined.**; Feyrer, Nobriga & Sommer, *supra* note 36; Feyrer et al., *supra* note 311.
- <sup>317</sup> Telephone interview with Frederick Feyrer, U.S. Bureau of Reclamation (Sept. 21, 2010) (The years since 2000 include years that have large values for X2 (that is, the salinity gradient has moved upstream) as well as some of the lowest abundances for delta smelt on record, so these recent years may drive the overall relationship. Nevertheless, even when excluding the most recent 10 years, data still show that fall X2 conditions and adult population size predict subsequent young smelt abundance).
- <sup>318</sup> As noted above, water years in California are defined as October 1 through the following September 30. Water years in California are categorized based on the particular rainfall that year. The categories are wet, above normal, below normal, dry, and critically dry.
- <sup>319</sup> 40 C.F.R. § 131.5 (Mar. 23, 1995).
- <sup>320</sup> See Water Quality Standards for the Sacramento River, San Joaquin River, and San Francisco Bay and Delta of the State of California, 60 Fed. Reg. 4664 (Jan. 24, 1995).
- <sup>321</sup> Kimmerer, *supra* note 29 (The X2 standard has received continued review over the past 15 years. Although some of the individual species correlations had shifted over the years, the overall correlations were still valid); STATE WATER RES. CONTROL BD., *supra* note 60 (The State Board reviewed the X2 standard in 2006 and declined to pursue any changes to the operative criteria).
- <sup>322</sup> Kimmerer, *supra* note 29; Kimmerer, Gross & MacWilliams, *supra* note 307; BAXTER ET AL., *supra* note 33.
- <sup>323</sup> U.S. FISH & WILDLIFE SERV., RECOVERY PLAN FOR THE SACRAMENTO/SAN JOAQUIN DELTA NATIVE FISHES (1996), *available at* [http://ecos.fws.gov/docs/recovery\\_plan/961126.pdf](http://ecos.fws.gov/docs/recovery_plan/961126.pdf).
- <sup>324</sup> See historic graphs of abundance on pages 9-10.
- <sup>325</sup> Sommer et al., *supra* note 24.
- <sup>326</sup> U.S. FISH & WILDLIFE SERV., *supra* note 312; Feyrer, *supra* note 311; Nobriga & Herbold, *supra* note 37.
- <sup>327</sup> *Id.*
- <sup>328</sup> Memorandum from the Reg'l Dir., Fish & Wildlife Serv., Region 8 to the Operation Manager, Bureau of Reclamation, Cent. Valley Operations Office, 283-84 (Dec. 12, 2008) (Water years in California are categorized based on the particular rainfall that year. The categories are wet, above normal, below normal, dry, and critically dry).
- <sup>329</sup> U.S. FISH & WILDLIFE SERV., *supra* note 312.
- <sup>330</sup> PBS&J, INDEPENDENT EXPERT PANEL REVIEW OF THE FAMILY FARM ALLIANCE'S INFORMATION QUALITY ACT CORRECTION REQUESTS (Oct. 21, 2009), *available at* [http://www.fws.gov/informationquality/topics/FY2009/Family\\_Farm\\_Alliance/OCAP-IQA-APPEAL-response-expert-review.pdf](http://www.fws.gov/informationquality/topics/FY2009/Family_Farm_Alliance/OCAP-IQA-APPEAL-response-expert-review.pdf); A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay Delta Committee on Sustainable Water and Environmental Management in the California Bay Delta, National Research Council 2010, *available at* <http://www8.nationalacademies.org/cp/projectview.aspx?key=49175>.
- <sup>331</sup> Delta Smelt Consolidated Cases, No. 1:09-cv-00407 OWW DLB (E.D. Cal. Dec. 14, 2010) (The Memorandum Decision reached similar conclusions, finding that while X2 is a valid surrogate for delta smelt habitat, the particular

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requirements for the location of X2 set forth in the 2008 Delta Smelt Biological Opinion are not legally valid and must be reconsidered by USFWS).

<sup>332</sup> STATE WATER RES. CONTROL BD., FINAL REPORT ON DEVELOPMENT OF FLOW CRITERIA FOR THE SACRAMENTO-SAN JOAQUIN DELTA ECOSYSTEM 190 (Aug. 3, 2010), *available at*

[http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/final\\_rpt.shtml](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml).

<sup>333</sup> CAL. DEPT. OF FISH & GAME, QUANTIFIABLE BIOLOGICAL OBJECTIVES AND FLOW CRITERIA FOR AQUATIC AND TERRESTRIAL SPECIES OF CONCERN DEPENDENT ON THE DELTA (Nov. 23, 2010), *available at*

[http://www.dfg.ca.gov/water/water\\_rights\\_docs.html](http://www.dfg.ca.gov/water/water_rights_docs.html).

<sup>334</sup> Central Valley Project Improvement Act (CPVIA), Pub. L. 102-575 (1992); Omnibus Public Land Management Act of 2009, Pub. L. 111-11(2009).

<sup>335</sup> U.S. Fish & Wildlife Serv., Stockton Fish & Wildlife Office, <http://www.fws.gov/stockton/afnp/index.cfm> (last visited Oct. 26, 2010).

<sup>336</sup> SAN JOAQUIN RIVER GROUP AUTHORITY, 2009 ANNUAL TECHNICAL REPORT, SAN JOAQUIN RIVER AGREEMENT & VERNALIS ADAPTIVE MANAGEMENT PLAN, *available at* <http://www.sjrg.org/> (last visited Oct. 26, 2010).

<sup>337</sup> California Department of Fish & Game, Grandtab, *available at*

<http://www.calfish.org/Programs/AdditionalPrograms/CDFGFisheriesBranch/tabid/104/Default.aspx> (last visited Nov. 30, 2010).

<sup>338</sup> WILLIAM FLEENOR ET AL., ON DEVELOPING PRESCRIPTIONS FOR FRESHWATER FLOWS TO SUSTAIN DESIRABLE FISHES IN THE SACRAMENTO-SAN JOAQUIN DELTA 43 (2010) (Submitted to the State Water Resources Control Board regarding flow criteria for the Delta necessary to protect public trust resources).

<sup>339</sup> Carl Mesick, *The Effects of San Joaquin River Flows and Delta Export Rates During October on the Number of Adult San Joaquin Chinook Salmon that Stray*, 179 FISH BULLETIN 139, 139-62 (2001).

<sup>340</sup> Richard J. Hallock et al., *Migrations of Adult King Salmon *Oncorhynchus tshawytscha* in the San Joaquin Delta as Demonstrated by the use of Sonic Tags*, 151 FISH BULLETIN (1970), *available at*

<http://content.cdlib.org/ark:/13030/kt1p3001mh/>.

<sup>341</sup> Mesick, *supra* note 339.

<sup>342</sup> California Department of Water Resources, Dayflow, <http://www.water.ca.gov/dayflow/> (last visited Nov. 17, 2010).

<sup>343</sup> Mesick, *supra* note 339.

<sup>344</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., BASIN PLAN (2009), *available at*

[http://www.waterboards.ca.gov/rwqcb5/water\\_issues/basin\\_plans/](http://www.waterboards.ca.gov/rwqcb5/water_issues/basin_plans/).

<sup>345</sup> STATE WATER RES. CONTROL BD., *supra* note 60 at 14 (The narrative criteria states: "Water quality conditions shall be maintained, together with other measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provisions of state and federal law"); CENT. VALLEY REG'L WATER QUALITY CONTROL BD., *supra* note 344 (The Central Valley Regional Water Quality Control Board's Basin Plan for the Sacramento and San Joaquin Basins also includes a narrative temperature objective as well as a numeric objective for aquatic life species, which states: "The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses....At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. ... In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected").

<sup>346</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., AMENDMENTS TO THE 1994 WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS III-5.0 (2005), *available at*

[http://www.swrcb.ca.gov/rwqcb5/water\\_issues/basin\\_plans/newpages200702.pdf](http://www.swrcb.ca.gov/rwqcb5/water_issues/basin_plans/newpages200702.pdf) ("Within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below: 7.0 mg/l in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/l in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/l in all other Delta waters except for those bodies of water which are constructed for special purposes and from which fish have been excluded").

<sup>347</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., TMDL AND BASIN PLAN AMENDMENT ON DISSOLVED OXYGEN IN THE STOCKTON DEEP WATER SHIP CHANNEL (2005), *available at*

[http://www.swrcb.ca.gov/centralvalley/water\\_issues/tmdl/central\\_valley\\_projects/san\\_joaquin\\_oxygen/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/san_joaquin_oxygen/index.shtml).

<sup>348</sup> CENT. VALLEY REG'L WATER QUALITY BD., SAN JOAQUIN RIVER DISSOLVED OXYGEN TMDL – FINAL STAFF Report (Feb. 2005), *available at*

[http://www.swrcb.ca.gov/rwqcb5/water\\_issues/tmdl/central\\_valley\\_projects/san\\_joaquin\\_oxygen/final\\_staff\\_report/index.shtml](http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_oxygen/final_staff_report/index.shtml).

<sup>349</sup> CARL MESICK ET AL., ANADROMOUS FISH RESTORATION PROGRAM, U.S. FISH & WILDLIFE SERV., OFFICE OF THE NAT'L MARINE FISHERIES SERV., LIMITING FACTOR ANALYSES & RECOMMENDED STUDIES FOR FALL-RUN CHINOOK SALMON AND RAINBOW TROUT IN THE TUOLUMNE RIVER (2008).

<sup>350</sup> CENT. VALLEY REG'L WATER QUALITY CONTROL BD., *supra* note 344 at III-8 ("The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.....At no time or place shall the temperature of [waters with a 'migration of aquatic organisms' designated use] be increased more than 5 degrees F above natural receiving water temperature....").

<sup>351</sup> CAL. DEPT. OF FISH & GAME, EFFECTS OF WATER TEMPERATURE ON ANADROMOUS SALMONIDS IN THE SAN JOAQUIN RIVER BASIN (Feb. 2010), *available at* <http://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17962>; U.S. ENVTL. PROT. AGENCY, REGION 10 GUIDANCE FOR PACIFIC NORTHWEST STATE AND TRIBAL TEMPERATURE WATER QUALITY STANDARDS 49 (2003), *available at* [http://yosemite.epa.gov/R10/water.nsf/6cb1a1df2c49e4968825688200712cb7/b3f932e58e2f3b9488256d16007d3bca/\\$FILE/TempGuidanceEPAFinal.pdf](http://yosemite.epa.gov/R10/water.nsf/6cb1a1df2c49e4968825688200712cb7/b3f932e58e2f3b9488256d16007d3bca/$FILE/TempGuidanceEPAFinal.pdf).

<sup>352</sup> Letter from Alexis Strauss, *supra* note 93.

<sup>353</sup> Letter from Maria Rea, Sacramento Area Office Supervisor, NOAA to Alexis Strauss, Water Div. Dir., U.S. EPA Region IX (Nov. 12, 2010).

<sup>354</sup> STATE WATER RES. CONTROL BD., DRAFT TECHNICAL REPORT ON THE SCIENTIFIC BASIS FOR ALTERNATIVE SAN JOAQUIN RIVER FLOW AND SOUTHERN DELTA SALINITY OBJECTIVES (Oct. 31, 2010), *available at* [http://www.swrcb.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/bay\\_delta\\_plan/water\\_quality\\_control\\_planning/docs/techrpt102910.pdf](http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/techrpt102910.pdf).

<sup>355</sup> These proposed dates may be delayed given resource constraints at the State Board. *See* STATE WATER RES. CONTROL BD., STRATEGIC WORKPLAN FOR THE BAY-DELTA, SCHEDULE OF ELEMENT ACTIONS TABLE (Jan. 14, 2010), *available at* [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/element\\_actions/docs/timeline2009qtr4.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/element_actions/docs/timeline2009qtr4.pdf).

<sup>356</sup> STATE WATER RES. CONTROL BD., *supra* note 354 at 65.

<sup>357</sup> STATE WATER RES. CONTROL BD., *supra* note 332 at 121 (The recommendations in this report do not take effect unless and until the Water Boards review and adopt them as part of their water quality control plans, basin plans, or water rights orders).

<sup>358</sup> NAT'L MARINE FISHERIES SERV., BIOLOGICAL OPINION AND CONFERENCE OPINION ON THE LONG-TERM OPERATIONS OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT (JUNE 4, 2009).

<sup>359</sup> *Id.* at 623-24.

<sup>360</sup> DELTA STEWARDSHIP COUNCIL, DELTA SCIENCE PROGRAM, THE VERNALIS ADAPTIVE MANAGEMENT PROGRAM (VAMP): REPORT OF THE 2010 REVIEW PANEL (MAY 13, 2010), *available at* [http://www.deltacouncil.ca.gov/delta\\_science\\_program/pdf/review\\_vamp\\_panel\\_report\\_final\\_051110.pdf](http://www.deltacouncil.ca.gov/delta_science_program/pdf/review_vamp_panel_report_final_051110.pdf).

<sup>361</sup> Central Valley Project Improvement Act (CPVIA), Pub. L. 102-575 (1992); Omnibus Public Land Management Act of 2009, Pub. L. 111-11(2009) (Planning and environmental studies are currently being completed under the authority and funding of the CVPIA. The CVPIA included provisions for developing a restoration plan for the San Joaquin River and instituted a fee structure of Friant Division contractors for such activities. With the passage of Omnibus Public Land Management Act of 2009, the Settlement establishes the San Joaquin River Restoration Fund. Approximately \$17 million per year from the Central Valley Project Friant Division would be deposited into the Fund to be available without further appropriations to implement the provisions of the Settlement).

<sup>362</sup> DELTA STEWARDSHIP COUNCIL, *supra* note 360.

<sup>363</sup> THE BAY INST. OF SAN FRANCISCO, *supra* note 304.

<sup>364</sup> *Id.*

<sup>365</sup> WILLIAM J. MITSCH & JAMES G. GOSSELINK, WETLANDS 561-64 (2d ed. 1993).

<sup>366</sup> THE BAY INST. OF SAN FRANCISCO, *supra* note 304.

<sup>367</sup> *Id.*

<sup>368</sup> MITSCH, *supra* note 365.

<sup>369</sup> LUND, *supra* note 22.

<sup>370</sup> DELTA VISION, DELTA HISTORY AND MANAGEMENT ISSUES (Nov. 27, 2006), *available at* <http://deltavision.ca.gov/DeltaVisionMeetingMaterials.shtml>.

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<sup>371</sup> CAL. NATURAL RES. AGENCY, STATE OF THE STATE'S WETLAND RESOURCES: 10 YEARS OF CHALLENGES AND PROGRESS (June 2010), *available at* [http://www.resources.ca.gov/docs/SOSW\\_report\\_with\\_cover\\_memo\\_10182010.pdf](http://www.resources.ca.gov/docs/SOSW_report_with_cover_memo_10182010.pdf).

**From:** Jason Peltier  
**Sent:** Thursday, February 10, 2011 9:54 AM  
**To:** 'Larrabee, Jason'; 'Weaver, Kiel'  
**CC:** joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** FW: EPA's Advanced Notice of Proposed Rulemaking

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Thursday, February 10, 2011 8:53 AM  
**To:** Schwinn.Karen@epamail.epa.gov  
**Subject:** RE: EPA's Advanced Notice of Proposed Rulemaking

Karen, I need some help understanding your process here. Particularly, how do I respond to this question: How can this be a "proposed rulemaking" but at the same time, have "...no regulatory effect?"

Thanks, Jason

---

**From:** Schwinn.Karen@epamail.epa.gov [mailto:Schwinn.Karen@epamail.epa.gov]  
**Sent:** Thursday, February 10, 2011 8:18 AM  
**To:** undisclosed-recipients:  
**Subject:** EPA's Advanced Notice of Proposed Rulemaking

As you may have heard, today, EPA issued an Advance Notice of Proposed Rulemaking (ANPR) initiating an EPA assessment of the effectiveness of current programs designed to protect water quality and aquatic species habitat in the Bay Delta Estuary. Through this ANPR, EPA is soliciting input on how water quality and aquatic resource protection goals can be better achieved in the estuary.

The ANPR discusses water quality contaminants, including ammonia, selenium, emerging contaminants and pesticides, as well as physical characteristics of waters that are important to estuarine species and salmonids, such as temperature, salinity and wetlands habitat. It also summarizes the regulatory framework for each of these stressors. EPA is soliciting comment on how to best use Clean Water Act programs to improve Bay Delta Estuary water quality. No new rules are proposed and the ANPR has no regulatory effect. The comment period extends 60 days from the Federal Register publication, which will be in about one week.

The ANPR and associated materials are available at [www.epa.gov/region9/water/watershed/sfbay-delta](http://www.epa.gov/region9/water/watershed/sfbay-delta).

Please call or email if you have any questions or would like to talk about this. - Karen

~~~~~  
KAREN SCHWINN  
Associate Director  
Water Division  
U.S. EPA Region 9  
75 Hawthorne Street (Wtr-1)  
San Francisco, CA 94105  
415/972-3472  
415/297-5509 (mobile)  
415/947-3537 (fax)  
~~~~~

**From:** Jason Peltier  
**Sent:** Thursday, February 10, 2011 11:38 AM  
**To:** 'D'Adamo, Dee Dee'  
**CC:** joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** FW: SWC: EPA Press Release

FYI

---

**From:** Walthall, Brent [mailto:bwalthall@kcwa.com]  
**Sent:** Thursday, February 10, 2011 10:28 AM  
**Subject:** RE: SWC: EPA Press Release

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But we also need to balance our choice to be circumspect with the realities that EPA can singlehandedly change the direction of the BDCP or even stop it simply by issuing rules, or even just making statements about standards such as X2. An EPA rule, finding, paper, study etc... that sets or advocates X2 as it appeared in the BOs kills the BDCP.

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A non-aggressive, non-combative approach is of course preferable, but it still must be clear that EPA should not set separate salinity standards for the Delta except as a partner with the federal agencies that participate in the BDCP.

Thanks,  
Brent

-

---

Brent Walthall ■ Assistant GM ■ Kern County Water Agency ■ (916) 325-1600 ■ bwalthall@kcwa.com

---

**From:** Ann Newton [mailto:anewton@fionahuttonassoc.com]  
**Sent:** Thursday, February 10, 2011 10:09 AM  
**To:** 'Philp,Thomas S'; acomisar@fionahuttonassoc.com; AHelman@randlecommunications.com; ara.azhderian@sldmwa.org; bbrewer@zone7water.com; bbuck@sfcwa.org; bkahrl@westlandswater.org; 'Muir,Bob'; Walthall, Brent; [REDACTED]@[REDACTED] [REDACTED]@[REDACTED] [REDACTED] fhutton@fionahuttonassoc.com; FBrewster@valleywater.org; gholman@westlandswater.org; [REDACTED]@[REDACTED].[REDACTED] jpeltier@westlandswater.org;



karends@zone7water.com; 'Cole,Kathy'; Laurak@swc.org; 'Waade,Linda D'; mgrimes@valleywater.org;  
mruiz@valleywater.org; maryloucotton@kennedyjenks.com; mwade@farmwater.org; MZak@randlecommunications.com;  
[REDACTED]@ [REDACTED] [REDACTED] terryerlewine@swc.org; [REDACTED]@ [REDACTED] [REDACTED] walt.wadlow@acwd.com;  
jenniferp@acwa.com

**Subject:** RE: SWC: EPA Press Release

After seeing this morning's articles, EPA's messaging and their acknowledgment of working with BDCP, Fiona and I think we may want to tone down some of the messaging points we discussed on yesterday's call. We can emphasize the need for EPA to integrate into the BDCP process without sounding too irritated about them launching this investigation. Better to be cautious but hopeful that we can work seamlessly with them...

Thoughts from the group? We're working up the statement this morning and checking in to see who else may be writing pieces today.

Ann



Ann Newton  
Senior Account Executive  
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**From:** Philp, Thomas S [mailto:TPhilp@mwdh2o.com]

**Sent:** Thursday, February 10, 2011 9:00 AM

**To:** 'anewton@fionahuttonassoc.com'; 'acomisar@fionahuttonassoc.com'; 'AHelman@randlecommunications.com'; 'ara.azhderian@sldmwa.org'; 'bbrewer@zone7water.com'; 'bbuck@sfcwa.org'; 'bkahl@westlandswater.org'; Muir,Bob; 'bwalthall@kcwa.com'; [REDACTED]@ [REDACTED] [REDACTED]@ [REDACTED] [REDACTED] 'fhutton@fionahuttonassoc.com'; 'FBrewster@valleywater.org'; 'gholman@westlandswater.org'; [REDACTED]@ [REDACTED] [REDACTED] 'jpeltier@westlandswater.org'; 'karends@zone7water.com'; 'Cole,Kathy'; 'Laurak@swc.org'; 'Waade,Linda D'; 'mgrimes@valleywater.org'; 'mruiz@valleywater.org'; 'maryloucotton@kennedyjenks.com'; 'mwade@farmwater.org'; 'MZak@randlecommunications.com'; [REDACTED]@ [REDACTED] [REDACTED] 'terryerlewine@swc.org'; [REDACTED]@ [REDACTED] [REDACTED] 'walt.wadlow@acwd.com'; 'jenniferp@acwa.com'

**Subject:** Re: SWC: EPA Press Release

Our release should focus on how the flow-related issues belong in bdcg.....

-----

---

**From:** Ann Newton [mailto:anewton@fionahuttonassoc.com]  
**Sent:** Thursday, February 10, 2011 07:33 AM  
**To:** 'Alex Comisar' <acomisar@fionahuttonassoc.com>; 'Ana Helman' <AHelman@randlecommunications.com>; Ara.azhderian@sldmwa.org <Ara.azhderian@sldmwa.org>; bbrewer@zone7water.com <bbrewer@zone7water.com>; bbuck@sfcwa.org <bbuck@sfcwa.org>; 'Bill Kahl' <bkahl@westlandswater.org>; Muir,Bob; 'Brent Walthall' <bwwalthall@kcwa.com>; 'Byron Buck' <[REDACTED]@[REDACTED]>; 'Deborah Kollars' <[REDACTED]@[REDACTED]>; 'Fiona Hutton' <fhutton@fionahuttonassoc.com>; 'Frances Bruster' <fbrewster@valleywater.org>; gholman@westlandswater.org <gholman@westlandswater.org>; 'Greg Zlotnick' <[REDACTED]@[REDACTED]>; 'Jason Peltier' <Jpeltier@westlandswater.org>; karends@zone7water.com <karends@zone7water.com>; Cole,Kathy; 'Laura King Moon' <Laurak@swc.org>; Waade,Linda D; 'Marty Grimes' <mgrimes@valleywater.org>; 'Mary Ann Ruiz' <mruiz@valleywater.org>; 'Mary Lou Cotton' <maryloucotton@KennedyJenks.com>; 'Mike Wade' <mwade@farmwater.org>; 'Mitch Zak' <MZak@randlecommunications.com>; 'Sarah Woolf' <[REDACTED]@[REDACTED]>; 'Terry Erlewine' <terryerlewine@swc.org>; Philp,Thomas S; 'Tim Hunt' <[REDACTED]@[REDACTED]>; walt.wadlow@acwd.com <walt.wadlow@acwd.com>; 'Jennifer Persike' <jenniferp@acwa.com>  
**Subject:** SWC: EPA Press Release

Note section about coordinating with BDCP and quote from David Hayes welcoming the announcement.

## U.S. EPA Launches Investigation into Toxins and Stressors Impacting Fish in the Bay-Delta

Release date: 02/09/2011

Contact Information: MEDIA CONTACTS: Mary Simms, Press Officer, U.S. EPA, (415) 947-4270, simms.mary@epa.gov Yoshiko Hill, Public Affairs Intern, U.S. EPA, (415) 947-4308, hill.yoshiko@epa.gov

**SAN FRANCISCO** –The U.S. Environmental Protection Agency will today take action on an Advanced Notice of Proposed Rulemaking (ANPR) seeking public input on the effectiveness of current water quality programs influencing the health of the San Francisco Bay Delta Estuary. The ANPR identifies pivotal water quality issues affecting Bay Delta fisheries, describes regulatory measures currently underway, and initiates an information-gathering process on how the EPA and the State of California can achieve water quality and aquatic resource protection goals in one of the West Coast's most ecologically diverse and important aquatic habitats.

The Bay Delta is the hub of California's water distribution system, providing drinking water to 25 million people, sustaining irrigation for 4 million acres of farmland, and supporting 750 different species of plants, fish, and wildlife, several of which are endangered or threatened. The water quality of the Bay Delta Estuary and many of its tributaries is impaired, the estuarine habitat is shrinking and many fish populations are at all-time lows.

"The Bay Delta is a major source of our tap water and the water used to grow our food," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "EPA is committed to tackling the pollution degrading the Delta, which is threatened by contaminants from sewage, pesticides, and a host of other chemicals."

No single factor is responsible for the decline of the Bay Delta's health. The present condition of the estuary reflects the cumulative and interactive effects of multiple factors, including water pollution, invasive species, water diversion and habitat degradation. Impacts associated with these stressors include toxicity to fish, invertebrates and their food sources, developmental deformities, and reproductive problems.

This ANPR is part of a comprehensive set of commitments made by the Obama Administration to address California water issues under the Interim Federal Action Plan released in December 2009. Through this plan, the Administration has promoted water conservation and efficiency improvements throughout California, dedicated more than \$40 million to drought relief projects, and made historic investments in modernizing California's water infrastructure.

"Communities rely on their water resources to supply clean water, sustain their environment, and support vital economic activities," said Nancy Sutley, Chair of the White House Council on Environmental Quality. "Identifying the water quality challenges in the Bay Delta is key to addressing the delta's complex and long-standing water problems and ensuring healthy communities and economies in California."

In its ANPR, EPA notes that it will be coordinating its review of water quality issues with the on-going development of the Bay Delta Conservation Plan, which currently is being developed through a collaboration of federal, state and local agencies, environmental organizations, and other interested parties.

Deputy Secretary of the Interior, David J. Hayes, who has been helping to lead the BDCP effort for the federal agencies, welcomed EPA's action, noting that "EPA's attention to a variety of water quality stressors and the role they play is an important complement to the science-based analysis that is going

into the Bay Delta Conservation Plan effort.”

He continued: “The Administration is committed to working together across our agencies to use the best science to meet the twin goals that California has adopted for the Bay Delta in its comprehensive new water legislation: a more reliable water supply and a restored and enhanced ecosystem – including improved water quality.”

In addition to protecting aquatic species’ habitat, the federal Clean Water Act charges EPA with protecting water quality for a variety of uses that are not addressed in this ANPR, including water for drinking and agriculture. Water quality standards are established under the Clean Water Act to protect public health, welfare, and the protection and propagation of fish, shell fish, and wildlife.

The ANPR identifies specific issues for which the EPA has regulatory responsibility and solicits comment on topics, such as potential site-specific water quality standards and site-specific changes to pesticide regulation. Summaries describing environmental stressors and the regulatory framework necessary to address them are also included in the ANPR.

California’s State and Regional Water Boards have the lead role under the federal Clean Water Act to protect water quality; they are actively engaged in multiple efforts, including establishing numeric water quality criteria and developing and implementing watershed improvement plans. The recovery of the Bay Delta reflects national efforts to ensure higher water quality, protect public health, and support essential fish, shell fish, and wildlife populations. The EPA, in collaboration with the State Water Resource Control Board and the Regional Water Quality Control Board, seeks to protect the biological, physical, and chemical integrity of the Bay Delta and its aquatic resources. Public input and scientific findings obtained from the ANPR will be reviewed and used to develop a strategic proposal for future EPA efforts toward protecting the Bay Delta and other important waterways.

The ANPR solicits public input on how EPA and the State of California can achieve water quality and aquatic resource protection goals in the Bay Delta Estuary and how to best use Clean Water Act programs to improve Delta water quality. No new rules are proposed in the ANPR and the ANPR has no regulatory effect.

The ANPR will be published to the Federal Register within one week. EPA encourages interested parties to read the ANPR and provide additional information and suggestions for actions to improve Bay Delta Estuary water quality and aquatic resource protection. Comments can be submitted electronically at the Federal Rulemaking Portal ([www.regulations.gov](http://www.regulations.gov)) identified by docket EPA-R09-OW-210-0976 or in hardcopy addressed to Erin Foresman, US Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105.

For more information, please visit: <http://www.epa.gov/region9/water/watershed/sfbay-delta>



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**From:** D'Adamo, Dee Dee  
**Sent:** Thursday, February 10, 2011 11:54 AM  
**To:** 'jpeltier@westlandswater.org'; 'ara.azhderian@sldmwa.org'  
**CC:** 'joe.findaro@akerman.com'; 'DBernhardt@BHFS.com'; Murray, Jaclyn; Varner, Callie  
**Subject:** Re: SWC: EPA Press Release

Just got off the congressional briefing conf call.

I asked the question about x-2 and coordination with BDCP vs. additional regulatory action. They claim that they'll coordinate with BDCP, but they also support st board to look at a delta outflow criteria that is protective of water quality for species.

They are also working on updating the selenium standard (in 1-2 years) which will impact ag drainers, but they claim that they have informed stakeholders of this for quite some time. Is this an accurate statement?

---

**From:** Jason Peltier <jpeltier@westlandswater.org>  
**To:** D'Adamo, Dee Dee  
**Cc:** joe.findaro@akerman.com <joe.findaro@akerman.com>; 'Bernhardt, David L.' <DBernhardt@BHFS.com>  
**Sent:** Thu Feb 10 13:37:58 2011  
**Subject:** FW: SWC: EPA Press Release

FYI

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**From:** Walthall, Brent [mailto:bwalthall@kcwa.com]  
**Sent:** Thursday, February 10, 2011 10:28 AM  
**Subject:** RE: SWC: EPA Press Release

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Thanks,

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Our release should focus on how the flow-related issues belong in bdcf.....

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Sent using BlackBerry

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**From:** Ann Newton [mailto:anewton@fionahuttonassoc.com]

**Sent:** Thursday, February 10, 2011 07:33 AM

**To:** 'Alex Comisar' <acomisar@fionahuttonassoc.com>; 'Ana Helman' <AHelman@randlecommunications.com>; Ara.azhderian@sldmwa.org <Ara.azhderian@sldmwa.org>; bbrewer@zone7water.com <bbrewer@zone7water.com>; bbuck@sfcwa.org <bbuck@sfcwa.org>; 'Bill Kahl' <bkahl@westlandswater.org>; Muir, Bob; 'Brent Walthall' <bwalthall@kcwa.com>; 'Byron Buck' <[REDACTED]@[REDACTED]>; 'Deborah Kollars' <[REDACTED]@[REDACTED]>; 'Fiona Hutton' <fhutton@fionahuttonassoc.com>; 'Frances Bruster' <fbrewster@valleywater.org>; gholman@westlandswater.org <gholman@westlandswater.org>; 'Greg Zlotnick' <[REDACTED]@[REDACTED]>; 'Jason Peltier' <Jpeltier@westlandswater.org>; karends@zone7water.com <karends@zone7water.com>; Cole, Kathy; 'Laura King Moon' <Laurak@swc.org>; Waade, Linda D; 'Marty Grimes' <mgrimes@valleywater.org>; 'Mary Ann Ruiz' <mruiz@valleywater.org>; 'Mary Lou Cotton' <maryloucotton@KennedyJenks.com>; 'Mike Wade' <mwade@farmwater.org>; 'Mitch Zak' <MZak@randlecommunications.com>; 'Sarah Woolf' <[REDACTED]@[REDACTED]>; 'Terry Erlewine' <terryerlewine@swc.org>; Philp, Thomas S; 'Tim Hunt' <[REDACTED]@[REDACTED]>; walt.wadlow@acwd.com <walt.wadlow@acwd.com>; 'Jennifer Persike' <jenniferp@acwa.com>

**Subject:** SWC: EPA Press Release

Note section about coordinating with BDCF and quote from David Hayes welcoming the announcement.

## U.S. EPA Launches Investigation into Toxins and Stressors Impacting Fish in the Bay-Delta

Release date: 02/09/2011

Contact Information: MEDIA CONTACTS: Mary Simms, Press Officer, U.S. EPA, (415) 947-4270, simms.mary@epa.gov Yosh ko Hill, Public Affairs Intern, U.S. EPA, (415) 947-4308, hill.yoshiko@epa.gov

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"The Bay Delta is a major source of our tap water and the water used to grow our food," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "EPA is committed to tackling the pollution degrading the Delta, which is threatened by contaminants from sewage, pesticides, and a host of other chemicals."

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include toxicity to fish, invertebrates and their food sources, developmental deformities, and reproductive problems.

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In its ANPR, EPA notes that it will be coordinating its review of water quality issues with the on-going development of the Bay Delta Conservation Plan, which currently is being developed through a collaboration of federal, state and local agencies, environmental organizations, and other interested parties.

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For more information, please visit: <http://www.epa.gov/region9/water/watershed/sfbay-delta>



Ann Newton  
Senior Account Executive  
Fiona Hutton & Associates, Inc.  
T: 818.760.2121  
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**From:** Ara Azhderian  
**Sent:** Thursday, February 10, 2011 12:06 PM  
**To:** D'Adamo, Dee Dee; [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**CC:** [joe.findaro@akerman.com](mailto:joe.findaro@akerman.com); [DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com); Murray, Jaclyn; Varner, Callie  
**Subject:** RE: SWC: EPA Press Release

So they can have it both ways...

On selenium, Dennis says that they are/have been aware of this and are planning outreach to educate.

Sent with Good ([www.good.com](http://www.good.com))

-----Original Message-----

From: D'Adamo, Dee Dee [<mailto:DeeDee.DAdamo@mail.house.gov>]  
Sent: Thursday, February 10, 2011 10:52 AM Pacific Standard Time  
To: 'jpeltier@westlandswater.org'; Ara Azhderian  
Cc: 'joe.findaro@akerman.com'; 'DBernhardt@BHFS.com'; Murray, Jaclyn; Varner, Callie  
Subject: Re: SWC: EPA Press Release

Just got off the congressional briefing conf call.

I asked the question about x-2 and coordination with BDCP vs. additional regulatory action. They claim that they'll coordinate with BDCP, but they also support st board to look at a delta outflow criteria that is protective of water quality for species.

They are also working on updating the selenium standard (in 1-2 years) which will impact ag drainers, but they claim that they have informed stakeholders of this for quite some time. Is this an accurate statement?

---

From: Jason Peltier <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>  
To: D'Adamo, Dee Dee  
Cc: [joe.findaro@akerman.com](mailto:joe.findaro@akerman.com) <[joe.findaro@akerman.com](mailto:joe.findaro@akerman.com)>; 'Bernhardt, David L.' <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)>  
Sent: Thu Feb 10 13:37:58 2011  
Subject: FW: SWC: EPA Press Release

FYI

From: Walthall, Brent [<mailto:bwalthall@kcwa.com>]  
Sent: Thursday, February 10, 2011 10:28 AM

Subject: RE: SWC: EPA Press Release

Discretion is the better part of valor (or some equally tired and overused euphemism).

But we also need to balance our choice to be circumspect with the realities that EPA can singlehandedly change the direction of the BDCP or even stop it simply by issuing rules, or even just making statements about standards such as X2. An EPA rule, finding, paper, study etc... that sets or advocates X2 as it appeared in the BOs kills the BDCP.

X2 has done little if anything to help the Delta fish, but it has become a iconic flash point between the stakeholders. That makes its value small but its risk to the process very high. That risk, heightened by EPA's effort to separately look at salinity in the Delta, and to separately develop standards for it is in a very realistic view capable of stopping the BDCP in spite of the good efforts of EPA's sister federal agencies working on the BDCP.

We should be clear in our statement that EPA needs to coordinate with its sister agencies who are way ahead of it on the issue of salinity, they need to be a bigger part of the BDCP, and if they want to initiate a separate process for the Delta then they should leave out of that process all of the standards (WQ and otherwise) that are being handled by the BDCP.

In 1994 the EPA acted on its own authority, but under threat of a lawsuit from the environmental community, and that action resulted

in X2. It is not beyond the pale that their motivation to start a separate look at the Delta salinity issue, even after the National Academy has already occupied that field, and to in effect step in front of the Academy does not indicate that EPA wants to cooperate with its sister federal agencies in spite of its protestations to the contrary.

A non-aggressive, non-combative approach is of course preferable, but it still must be clear that EPA should not set separate salinity standards for the Delta except as a partner with the federal agencies that participate in the BDCP.

Thanks,  
Brent

-

---

Brent Walthall • Assistant GM • Kern County Water Agency • (916) 325-1600 • [bwalthall@kcwa.com](mailto:bwalthall@kcwa.com)

From: Ann Newton [<mailto:anewton@fionahuttonassoc.com>]

Sent: Thursday, February 10, 2011 10:09 AM

To: 'Philp,Thomas S'; [acomisar@fionahuttonassoc.com](mailto:acomisar@fionahuttonassoc.com); [AHelman@randlecommunications.com](mailto:AHelman@randlecommunications.com); [ara.azhderian@sldmwa.org](mailto:ara.azhderian@sldmwa.org); [bbrewer@zone7water.com](mailto:bbrewer@zone7water.com); [bbuck@sfcwa.org](mailto:bbuck@sfcwa.org); [bkahrl@westlandswater.org](mailto:bkahrl@westlandswater.org); 'Muir,Bob'; Walthall, Brent;

██████████@██████████ ██████████@██████████ fhutton@fionahuttonassoc.com; FBrewster@valleywater.org; gholman@westlandswater.org; ██████████@██████████ jpeltier@westlandswater.org; karends@zone7water.com; 'Cole,Kathy'; Laurak@swc.org; 'Waade,Linda D'; mgrimes@valleywater.org; mruiz@valleywater.org; maryloucotton@kennedyjenks.com; mwade@farmwater.org; MZak@randlecommunications.com; ██████████@██████████ terryerlewine@swc.org;

██████████@██████████ walt.wadlow@acwd.com; jenniferp@acwa.com

Subject: RE: SWC: EPA Press Release

After seeing this morning's articles, EPA's messaging and their acknowledgment of working with BDCP, Fiona and I think we may want to tone down some of the messaging points we discussed on yesterday's call. We can emphasize the need for EPA to integrate into the BDCP process without sounding too irritated about them launching this investigation. Better to be cautious but hopeful that we can work seamlessly with them...

Thoughts from the group? We're working up the statement this morning and checking in to see who else may be writing pieces today.

Ann

[cid:image001.jpg@01CBC90B.38AAEC20]

Ann Newton

Senior Account Executive

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Find us on Facebook!<<http://www.facebook.com/pages/Studio-City-CA/Fiona-Hutton-Associates/108551116474?ref=mf>>

[cid:image002.jpg@01CBC90B.38AAEC20] <<http://www.facebook.com/pages/Studio-City-CA/Fiona-Hutton-Associates/108551116474?ref=mf>>

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From: Philp,Thomas S [<mailto:TPhilp@mwdh2o.com>]

Sent: Thursday, February 10, 2011 9:00 AM

To: '[anewton@fionahuttonassoc.com](mailto:anewton@fionahuttonassoc.com)'; '[acomisar@fionahuttonassoc.com](mailto:acomisar@fionahuttonassoc.com)'; '[AHelman@randlecommunications.com](mailto:AHelman@randlecommunications.com)';

'ara.azhderian@sldmwa.org'; 'bbrewer@zone7water.com'; 'bbuck@sfcwa.org'; 'bkahrl@westlandswater.org'; Muir,Bob;  
'bwalthall@kcwa.com'; [REDACTED]@[REDACTED] [REDACTED]@[REDACTED] [REDACTED] 'fhutton@fionahuttonassoc.com';  
'FBrewster@valleywater.org'; 'gholman@westlandswater.org'; [REDACTED]@[REDACTED] [REDACTED] 'jpeltier@westlandswater.org';  
'karends@zone7water.com'; Cole,Kathy; 'Laurak@swc.org'; Waade,Linda D; 'mgrimes@valleywater.org'; 'mruiz@valleywater.org';  
'maryloucotton@kennedyjenks.com'; 'mwade@farmwater.org'; 'MZak@randlecommunications.com'; [REDACTED]@[REDACTED] [REDACTED]  
'terryerlewine@swc.org'; [REDACTED]@[REDACTED] [REDACTED] 'walt.wadlow@acwd.com'; 'jenniferp@acwa.com'  
Subject: Re: SWC: EPA Press Release

Our release should focus on how the flow-related issues belong in bdcf.....

-----  
Sent using BlackBerry

From: Ann Newton [<mailto:anewton@fionahuttonassoc.com>]

Sent: Thursday, February 10, 2011 07:33 AM

To: 'Alex Comisar' <acomisar@fionahuttonassoc.com>; 'Ana Helman' <AHelman@randlecommunications.com>;  
Ara.azhderian@sldmwa.org <Ara.azhderian@sldmwa.org>; bbrewer@zone7water.com <bbrewer@zone7water.com>;  
bbuck@sfcwa.org <bbuck@sfcwa.org>; 'Bill Kahrl' <bkahrl@westlandswater.org>; Muir,Bob; 'Brent Walthall'  
<bwalthall@kcwa.com>; 'Byron Buck' <[REDACTED]@[REDACTED] [REDACTED] 'Deborah Kollars' <[REDACTED]@[REDACTED] [REDACTED] 'Fiona Hutton'  
<fhutton@fionahuttonassoc.com>; 'Frances Bruster' <fbrewster@valleywater.org>; gholman@westlandswater.org  
<gholman@westlandswater.org>; 'Greg Zlotnick' <[REDACTED]@[REDACTED] [REDACTED] 'Jason Peltier' <Jpeltier@westlandswater.org>;  
karends@zone7water.com <karends@zone7water.com>; Cole,Kathy; 'Laura King Moon' <Laurak@swc.org>; Waade,Linda D;  
'Marty Grimes' <mgrimes@valleywater.org>; 'Mary Ann Ruiz' <mruiz@valleywater.org>; 'Mary Lou Cotton'  
<maryloucotton@KennedyJenks.com>; 'Mike Wade' <mwade@farmwater.org>; 'Mitch Zak' <MZak@randlecommunications.com>;  
'Sarah Woolf' <[REDACTED]@[REDACTED] [REDACTED] 'Terry Erlewine' <terryerlewine@swc.org>; Philp,Thomas S; 'Tim Hunt'  
<[REDACTED]@[REDACTED] [REDACTED] walt.wadlow@acwd.com <walt.wadlow@acwd.com>; 'Jennifer Persike' <jenniferp@acwa.com>  
Subject: SWC: EPA Press Release

Note section about coordinating with BDCP and quote from David Hayes welcoming the announcement.

U.S. EPA Launches Investigation into Toxins and Stressors Impacting Fish in the Bay-Delta

Release date: 02/09/2011

Contact Information: MEDIA CONTACTS: Mary Simms, Press Officer, U.S. EPA, (415) 947-4270, [simms.mary@epa.gov](mailto:simms.mary@epa.gov) Yoshiko Hill, Public Affairs Intern, U.S. EPA, (415) 947-4308, [hill.yoshiko@epa.gov](mailto:hill.yoshiko@epa.gov)

SAN FRANCISCO –The U.S. Environmental Protection Agency will today take action on an Advanced Notice of Proposed Rulemaking (ANPR) seeking public input on the effectiveness of current water quality programs influencing the health of the San Francisco Bay Delta Estuary. The ANPR identifies pivotal water quality issues affecting Bay Delta fisheries, describes regulatory measures currently underway, and initiates an information-gathering process on how the EPA and the State of California can achieve water quality and aquatic resource protection goals in one of the West Coast's most ecologically diverse and important aquatic habitats.

The Bay Delta is the hub of California's water distribution system, providing drinking water to 25 million people, sustaining irrigation for 4 million acres of farmland, and supporting 750 different species of plants, fish, and wildlife, several of which are endangered or threatened. The water quality of the Bay Delta Estuary and many of its tributaries is impaired, the estuarine habitat is shrinking and many fish populations are at all-time lows.

"The Bay Delta is a major source of our tap water and the water used to grow our food," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "EPA is committed to tackling the pollution degrading the Delta, which is threatened by contaminants from sewage, pesticides, and a host of other chemicals."

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For more information, please visit: <http://www.epa.gov/region9/water/watershed/sfbay-delta>

[cid:image001.jpg@01CBC90B.38AAEC20]

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Senior Account Executive  
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[www.fionahuttonassoc.com](http://www.fionahuttonassoc.com)<<http://www.redgatecommunications.com/>>

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[cid:image002.jpg@01CBC90B.38AAEC20] <<http://www.facebook.com/pages/Studio-City-CA/Fiona-Hutton-Associates/108551116474?ref=mf>>

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**From:** Jason Peltier  
**Sent:** Thursday, February 10, 2011 12:09 PM  
**To:** 'D'Adamo, Dee Dee'; ara.azhderian@sldmwa.org  
**CC:** joe.findaro@akerman.com; DBernhardt@BHFS.com; 'Murray, Jaclyn'; 'Varner, Callie'  
**Subject:** RE: SWC: EPA Press Release

Thanks! perfect points. Yes, they are showing their cards re SWRCB.

I assume their comment on Se is accurate, Ara?

---

**From:** D'Adamo, Dee Dee [mailto:DeeDee.DAdamo@mail.house.gov]  
**Sent:** Thursday, February 10, 2011 10:54 AM  
**To:** 'jpeltier@westlandswater.org'; 'ara.azhderian@sldmwa.org'  
**Cc:** 'joe.findaro@akerman.com'; 'DBernhardt@BHFS.com'; Murray, Jaclyn; Varner, Callie  
**Subject:** Re: SWC: EPA Press Release

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**To:** D'Adamo, Dee Dee  
**Cc:** joe.findaro@akerman.com <joe.findaro@akerman.com>; 'Bernhardt, David L.' <DBernhardt@BHFS.com>  
**Sent:** Thu Feb 10 13:37:58 2011  
**Subject:** FW: SWC: EPA Press Release

FYI

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**Sent:** Thursday, February 10, 2011 10:28 AM  
**Subject:** RE: SWC: EPA Press Release

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Thanks,  
Brent

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Brent Walthall ■ Assistant GM ■ Kern County Water Agency ■ (916) 325-1600 ■ [bwalthall@kcwa.com](mailto:bwalthall@kcwa.com)

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**From:** Ann Newton [<mailto:anewton@fionahuttonassoc.com>]

**Sent:** Thursday, February 10, 2011 10:09 AM

**To:** 'Philp,Thomas S'; [acomisar@fionahuttonassoc.com](mailto:acomisar@fionahuttonassoc.com); [AHelman@randlecommunications.com](mailto:AHelman@randlecommunications.com); [ara.azhderian@sldmwa.org](mailto:ara.azhderian@sldmwa.org); [bbrewer@zone7water.com](mailto:bbrewer@zone7water.com); [bbuck@sfcwa.org](mailto:bbuck@sfcwa.org); [bkahrl@westlandswater.org](mailto:bkahrl@westlandswater.org); 'Muir,Bob'; Walthall, Brent; [REDACTED]@[REDACTED]; [REDACTED]@[REDACTED]; [fhutton@fionahuttonassoc.com](mailto:fhutton@fionahuttonassoc.com); [FBrewster@valleywater.org](mailto:FBrewster@valleywater.org); [gholman@westlandswater.org](mailto:gholman@westlandswater.org); [REDACTED]@[REDACTED]; [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org); [karends@zone7water.com](mailto:karends@zone7water.com); 'Cole,Kathy'; [Laurak@swc.org](mailto:Laurak@swc.org); 'Waade,Linda D'; [mgrimes@valleywater.org](mailto:mgrimes@valleywater.org); [mruiz@valleywater.org](mailto:mruiz@valleywater.org); [maryloucotton@kennedyjenks.com](mailto:maryloucotton@kennedyjenks.com); [mwade@farmwater.org](mailto:mwade@farmwater.org); [MZak@randlecommunications.com](mailto:MZak@randlecommunications.com); [REDACTED]@[REDACTED]; [terryerlewine@swc.org](mailto:terryerlewine@swc.org); [REDACTED]@[REDACTED]; [walt.wadlow@acwd.com](mailto:walt.wadlow@acwd.com); [jenniferp@acwa.com](mailto:jenniferp@acwa.com)

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Ann



Ann Newton  
Senior Account Executive  
Fiona Hutton & Associates, Inc.  
T: 818.760.2121  
F: 818.760.2202  
C: 310.774.7639  
[anewton@fionahuttonassoc.com](mailto:anewton@fionahuttonassoc.com)  
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**From:** Philp, Thomas S [mailto:TPhilp@mwdh2o.com]

**Sent:** Thursday, February 10, 2011 9:00 AM

**To:** 'anewton@fionahuttonassoc.com'; 'acomisar@fionahuttonassoc.com'; 'AHelman@randlecommunications.com'; 'ara.azhderian@sldmwa.org'; 'bbrewer@zone7water.com'; 'bbuck@sfcwa.org'; 'bkahl@westlandswater.org'; Muir, Bob; 'bwalthall@kcwa.com'; [REDACTED]@[REDACTED]; 'dkollars@comcast.net'; 'fhutton@fionahuttonassoc.com'; 'FBrewster@valleywater.org'; 'gholman@westlandswater.org'; [REDACTED]@[REDACTED]; 'jpeltier@westlandswater.org'; 'karends@zone7water.com'; Cole, Kathy; 'Laurak@swc.org'; Waade, Linda D; 'mgrimes@valleywater.org'; 'mruiz@valleywater.org'; 'maryloucotton@kennedyjenks.com'; 'mwade@farmwater.org'; 'MZak@randlecommunications.com'; [REDACTED]@[REDACTED]; 'terryerlewine@swc.org'; [REDACTED]@[REDACTED]; 'walt.wadlow@acwd.com'; 'jenniferp@acwa.com'

**Subject:** Re: SWC: EPA Press Release

Our release should focus on how the flow-related issues belong in bdcg.....

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Sent using BlackBerry

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**Sent:** Thursday, February 10, 2011 07:33 AM

**To:** 'Alex Comisar' <acomisar@fionahuttonassoc.com>; 'Ana Helman' <AHelman@randlecommunications.com>; Ara.azhderian@sldmwa.org <Ara.azhderian@sldmwa.org>; bbrewer@zone7water.com <bbrewer@zone7water.com>; bbuck@sfcwa.org <bbuck@sfcwa.org>; 'Bill Kahl' <bkahl@westlandswater.org>; Muir, Bob; 'Brent Walthall' <bwalthall@kcwa.com>; 'Byron Buck' <[REDACTED]@[REDACTED]>; 'Deborah Kollars' <[REDACTED]@[REDACTED]>; 'Fiona Hutton' <fhutton@fionahuttonassoc.com>; 'Frances Bruster' <fbrewster@valleywater.org>; gholman@westlandswater.org <gholman@westlandswater.org>; 'Greg Zlotnick' <[REDACTED]@[REDACTED]>; 'Jason Peltier' <Jpeltier@westlandswater.org>; karends@zone7water.com <karends@zone7water.com>; Cole, Kathy; 'Laura King Moon' <Laurak@swc.org>; Waade, Linda D; 'Marty Grimes' <mgrimes@valleywater.org>; 'Mary Ann Ruiz' <mruiz@valleywater.org>; 'Mary Lou Cotton' <maryloucotton@KennedyJenks.com>; 'Mike Wade' <mwade@farmwater.org>; 'Mitch Zak' <MZak@randlecommunications.com>; 'Sarah Woolf' <[REDACTED]@[REDACTED]>; 'Terry Erlewine' <terryerlewine@swc.org>; Philp, Thomas S; 'Tim Hunt' <[REDACTED]@[REDACTED]>; walt.wadlow@acwd.com <walt.wadlow@acwd.com>; 'Jennifer Persike' <jenniferp@acwa.com>

**Subject:** SWC: EPA Press Release

Note section about coordinating with BDCP and quote from David Hayes welcoming the announcement.

## U.S. EPA Launches Investigation into Toxins and Stressors Impacting Fish in the Bay-Delta

Release date: 02/09/2011

Contact Information: MEDIA CONTACTS: Mary Simms, Press Officer, U.S. EPA, (415) 947-4270, simms.mary@epa.gov Yosh ko Hill, Public Affairs Intern, U.S. EPA, (415) 947-4308, hill.yoshiko@epa.gov

**SAN FRANCISCO** –The U.S. Environmental Protection Agency will today take action on an Advanced Notice of Proposed Rulemaking (ANPR) seeking public input on the effectiveness of current water quality programs influencing the health of the San Francisco Bay Delta Estuary. The ANPR identifies

pivotal water quality issues affecting Bay Delta fisheries, describes regulatory measures currently underway, and initiates an information-gathering process on how the EPA and the State of California can achieve water quality and aquatic resource protection goals in one of the West Coast's most ecologically diverse and important aquatic habitats.

The Bay Delta is the hub of California's water distribution system, providing drinking water to 25 million people, sustaining irrigation for 4 million acres of farmland, and supporting 750 different species of plants, fish, and wildlife, several of which are endangered or threatened. The water quality of the Bay Delta Estuary and many of its tributaries is impaired, the estuarine habitat is shrinking and many fish populations are at all-time lows.

"The Bay Delta is a major source of our tap water and the water used to grow our food," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "EPA is committed to tackling the pollution degrading the Delta, which is threatened by contaminants from sewage, pesticides, and a host of other chemicals."

No single factor is responsible for the decline of the Bay Delta's health. The present condition of the estuary reflects the cumulative and interactive effects of multiple factors, including water pollution, invasive species, water diversion and habitat degradation. Impacts associated with these stressors include toxicity to fish, invertebrates and their food sources, developmental deformities, and reproductive problems.

This ANPR is part of a comprehensive set of commitments made by the Obama Administration to address California water issues under the Interim Federal Action Plan released in December 2009. Through this plan, the Administration has promoted water conservation and efficiency improvements throughout California, dedicated more than \$40 million to drought relief projects, and made historic investments in modernizing California's water infrastructure.

"Communities rely on their water resources to supply clean water, sustain their environment, and support vital economic activities," said Nancy Sutley, Chair of the White House Council on Environmental Quality. "Identifying the water quality challenges in the Bay Delta is key to addressing the delta's complex and long-standing water problems and ensuring healthy communities and economies in California."

In its ANPR, EPA notes that it will be coordinating its review of water quality issues with the on-going development of the Bay Delta Conservation Plan, which currently is being developed through a collaboration of federal, state and local agencies, environmental organizations, and other interested parties.

Deputy Secretary of the Interior, David J. Hayes, who has been helping to lead the BDCP effort for the federal agencies, welcomed EPA's action, noting that "EPA's attention to a variety of water quality stressors and the role they play is an important complement to the science-based analysis that is going into the Bay Delta Conservation Plan effort."

He continued: "The Administration is committed to working together across our agencies to use the best science to meet the twin goals that California has adopted for the Bay Delta in its comprehensive new water legislation: a more reliable water supply and a restored and enhanced ecosystem – including improved water quality."

In addition to protecting aquatic species' habitat, the federal Clean Water Act charges EPA with protecting water quality for a variety of uses that are not addressed in this ANPR, including water for drinking and agriculture. Water quality standards are established under the Clean Water Act to protect public health, welfare, and the protection and propagation of fish, shell fish, and wildlife.

The ANPR identifies specific issues for which the EPA has regulatory responsibility and solicits comment on topics, such as potential site-specific water quality standards and site-specific changes to pesticide regulation. Summaries describing environmental stressors and the regulatory framework necessary to address them are also included in the ANPR.

California's State and Regional Water Boards have the lead role under the federal Clean Water Act to protect water quality; they are actively engaged in multiple efforts, including establishing numeric water quality criteria and developing and implementing watershed improvement plans. The recovery of the Bay Delta reflects national efforts to ensure higher water quality, protect public health, and support essential fish, shell fish, and wildlife populations. The EPA, in collaboration with the State Water Resource Control Board and the Regional Water Quality Control Board, seeks to protect the biological, physical, and chemical integrity of the Bay Delta and its aquatic resources. Public input and scientific findings obtained from the ANPR will be reviewed and used to develop a strategic proposal for future EPA efforts toward protecting the Bay Delta and other important waterways.

The ANPR solicits public input on how EPA and the State of California can achieve water quality and aquatic resource protection goals in the Bay Delta Estuary and how to best use Clean Water Act programs to improve Delta water quality. No new rules are proposed in the ANPR and the ANPR has no regulatory effect.

The ANPR will be published to the Federal Register within one week. EPA encourages interested parties to read the ANPR and provide additional information and suggestions for actions to improve Bay Delta Estuary water quality and aquatic resource protection. Comments can be submitted electronically at the Federal Rulemaking Portal ([www.regulations.gov](http://www.regulations.gov)) identified by docket EPA-R09-OW-210-0976 or in hardcopy addressed to Erin Foresman, US Environmental Protection Agency, 75 Hawthorne Street, San Francisco, CA 94105.

For more information, please visit: <http://www.epa.gov/region9/water/watershed/sfbay-delta>

**FionaHutton&Associates**



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**From:** Ara Azhderian  
**Sent:** Thursday, February 10, 2011 12:18 PM  
**To:** Jason Peltier; D'Adamo, Dee Dee  
**CC:** joe.findaro@akerman.com; DBernhardt@BHFS.com; Murray, Jaclyn; Varner, Callie  
**Subject:** RE: SWC: EPA Press Release

Yes.

Sent with Good (www.good.com)

-----Original Message-----

From: Jason Peltier [<mailto:jpeltier@westlandswater.org>]  
Sent: Thursday, February 10, 2011 11:06 AM Pacific Standard Time  
To: 'D'Adamo, Dee Dee'; Ara Azhderian  
Cc: joe.findaro@akerman.com; DBernhardt@BHFS.com; 'Murray, Jaclyn'; 'Varner, Callie'  
Subject: RE: SWC: EPA Press Release

Thanks! perfect points. Yes, they are showing their cards re SWRCB.

I assume their comment on Se is accurate, Ara?

From: D'Adamo, Dee Dee [<mailto:DeeDee.DAdamo@mail.house.gov>]  
Sent: Thursday, February 10, 2011 10:54 AM  
To: 'jpeltier@westlandswater.org'; 'ara.azhderian@sldmwa.org'  
Cc: 'joe.findaro@akerman.com'; 'DBernhardt@BHFS.com'; Murray, Jaclyn; Varner, Callie  
Subject: Re: SWC: EPA Press Release

Just got off the congressional briefing conf call.

I asked the question about x-2 and coordination with BDCP vs. additional regulatory action. They claim that they'll coordinate with BDCP, but they also support st board to look at a delta outflow criteria that is protective of water quality for species.

They are also working on updating the selenium standard (in 1-2 years) which will impact ag drainers, but they claim that they have informed stakeholders of this for quite some time. Is this an accurate statement?

From: Jason Peltier <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>  
To: D'Adamo, Dee Dee  
Cc: joe.findaro@akerman.com <[joe.findaro@akerman.com](mailto:joe.findaro@akerman.com)>; 'Bernhardt, David L.' <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)>  
Sent: Thu Feb 10 13:37:58 2011  
Subject: FW: SWC: EPA Press Release  
FYI

From: Walthall, Brent [<mailto:bwalthall@kcwa.com>]  
Sent: Thursday, February 10, 2011 10:28 AM

Subject: RE: SWC: EPA Press Release

Discretion is the better part of valor (or some equally tired and overused euphemism).

But we also need to balance our choice to be circumspect with the realities that EPA can singlehandedly change the direction of the BDCP or even stop it simply by issuing rules, or even just making statements about standards such as X2. An EPA rule, finding, paper, study etc... that sets or advocates X2 as it appeared in the BOs kills the BDCP.

X2 has done little if anything to help the Delta fish, but it has become a iconic flash point between the stakeholders. That makes its value small but its risk to the process very high. That risk, heightened by EPA's effort to separately look at salinity in the Delta, and to separately develop standards for it is in a very realistic view capable of stopping the BDCP in spite of the good efforts of EPA's sister federal agencies working on the BDCP.

We should be clear in our statement that EPA needs to coordinate with its sister agencies who are way ahead of it on the issue of salinity, they need to be a bigger part of the BDCP, and if they want to initiate a separate process for the Delta then they should leave out of that process all of the standards (WQ and otherwise) that are being handled by the BDCP.

In 1994 the EPA acted on its own authority, but under threat of a lawsuit from the environmental community, and that action resulted in X2. It is not beyond the pale that their motivation to start a separate look at the Delta salinity issue, even after the National Academy has already occupied that field, and to in effect step in front of the Academy does not indicate that EPA wants to cooperate with its sister federal agencies in spite of its protestations to the contrary.

A non-aggressive, non-combative approach is of course preferable, but it still must be clear that EPA should not set separate salinity standards for the Delta except as a partner with the federal agencies that participate in the BDCP.

Thanks,  
Brent

-

---

Brent Walthall n Assistant GM n Kern County Water Agency n (916) 325-1600 n bwalthall@kcwa.com

From: Ann Newton [<mailto:anewton@fionahuttonassoc.com>]

Sent: Thursday, February 10, 2011 10:09 AM

To: 'Philp,Thomas S'; acomisar@fionahuttonassoc.com; AHelman@randlecommunications.com; ara.azhderian@sldmwa.org; bbrewer@zone7water.com; bbuck@sfcwa.org; bkahrl@westlandswater.org; 'Muir,Bob'; Walthall, Brent;

██████████@██████████ fhutton@fionahuttonassoc.com; FBrewster@valleywater.org; gholman@westlandswater.org; ██████████@██████████ jpeltier@westlandswater.org; karends@zone7water.com; 'Cole,Kathy'; Laurak@swc.org; 'Waade,Linda D'; mgrimes@valleywater.org; mruiz@valleywater.org; maryloucotton@kennedyjenks.com; mwade@farmwater.org; MZak@randlecommunications.com; ██████████@██████████ terryerlewine@swc.org; ██████████@██████████ walt.wadlow@acwd.com; jenniferp@acwa.com

Subject: RE: SWC: EPA Press Release

After seeing this morning's articles, EPA's messaging and their acknowledgment of working with BDCP, Fiona and I think we may want to tone down some of the messaging points we discussed on yesterday's call. We can emphasize the need for EPA to integrate into the BDCP process without sounding too irritated about them launching this investigation. Better to be cautious but hopeful that we can work seamlessly with them...

Thoughts from the group? We're working up the statement this morning and checking in to see who else may be writing pieces today.

Ann

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Sent: Thursday, February 10, 2011 9:00 AM

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Subject: Re: SWC: EPA Press Release

Our release should focus on how the flow-related issues belong in bdcp.....

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From: Ann Newton [<mailto:anewton@fionahuttonassoc.com>]

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Note section about coordinating with BDCP and quote from David Hayes welcoming the announcement.

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Release date: 02/09/2011

Contact Information: MEDIA CONTACTS: Mary Simms, Press Officer, U.S. EPA, (415) 947-4270, [simms.mary@epa.gov](mailto:simms.mary@epa.gov) Yoshiko Hill, Public Affairs Intern, U.S. EPA, (415) 947-4308, [hill.yoshiko@epa.gov](mailto:hill.yoshiko@epa.gov)

SAN FRANCISCO –The U.S. Environmental Protection Agency will today take action on an Advanced Notice of Proposed Rulemaking (ANPR) seeking public input on the effectiveness of current water quality programs influencing the health of the San Francisco Bay Delta Estuary. The ANPR identifies pivotal water quality issues affecting Bay Delta fisheries, describes regulatory measures currently underway, and initiates an information-gathering process on how the EPA and the State of California can achieve water quality and aquatic resource protection goals in one of the West Coast's most ecologically diverse and important aquatic habitats.

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For more information, please visit: <http://www.epa.gov/region9/water/watershed/sfbay-delta>



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**From:** Bernhardt, David L.

**Sent:** Wednesday, March 2, 2011 3:22 PM

**To:** Jason Peltier

**Subject:** Fwd: FYI: Chairman McClintock: We must restore abundance as the cornerstone of our federal water and power policies



FOR IMMEDIATE RELEASE  
Wednesday, March 02, 2011

CONTACT: [Jill Strait](#), [Spencer Pederson](#), [Crystal Feldman](#)  
202-226-9019

[PERMALINK](#)

## **Chairman McClintock: We must restore abundance as the cornerstone of our federal water and power policies**

*Bureau of Reclamation FY12 Budget Scrutinized by Subcommittee on Water and Power*

**WASHINGTON, D.C.** – The Subcommittee on Water and Power, held an oversight hearing today to examine the FY 2012 budget request for the Bureau of Reclamation (Reclamation). Subcommittee Chairman Tom McClintock (CA-04) also focused on Reclamation’s wasteful spending and a divergence from its original mission of providing water and power abundance that has resulted in lost jobs and economic hardships for Westerners.

*“It is the objective of this sub-committee to restore the original – and as yet unfulfilled mission of the Bureau of Reclamation – to develop and utilize our nation’s vast water and hydroelectric resources to build a new era of abundance and prosperity for our nation.*

*The failure of the last generation to keep pace with our water and power needs has caused chronic water shortages and skyrocketing electricity prices that are causing serious economic harm,” said Chairman McClintock. “I hope that this Administration will become a partner in this new era of abundance rather*

*than an obstacle. The rationing of shortages has never solved a shortage – only a policy of abundance can do that. We have wasted not only money but time, and we can afford to waste no more of either.”*

Last year due to regulations imposed by Reclamation to divert water from farms to a three inch fish, some communities in California’s San Joaquin Valley recorded 40% unemployment. This year, with Sierra Nevada snowpack at near record levels, San Joaquin farmers may only get 50% of their water allocations, keeping thousands out of work. Reclamation’s policies have clearly contributed to increased unemployment and higher consumer costs, particularly in rural communities.

*“Even with reservoirs nearly overflowing, anticipated water allocation levels are nowhere near the full allocation farmers should receive. Increasing water storage must be a top priority in the Valley,” said Rep. Jeff Denham (CA-19). “It is incomprehensible that farmers cannot receive the full allocation of water that they have a contract for even in wet years such as this one with a year-to-date snowpack at 127%.”*

Water lost due to environmental flows doesn’t just affect irrigators or municipal water users—hydropower generation also suffers greatly. Glenn Canyon Dam in northern Arizona has lost up to 1,000 megawatts, or enough to power one million homes, due to environmental mandates. Some wholesale electricity customers served by Reclamation power facilities are paying 16 to 30 percent higher rates because of environmental related regulations. Every megawatt of clean, cheap, reliable hydropower we lose must be replaced by more expensive forms of electricity—costs that will ultimately be passed on to the ratepayer.

*“The Administration is creating regulatory and administrative uncertainty that threatens thousands of jobs in my district and the long-term water supply for Arizona. Take for example the Navajo Generating Station (NGS), located near Page, AZ - the lack of coordination between the BoR, BIA, and the Office of Surface Management on critical services contracts related to the operation of the plant threatens its viability and the primary source of power for the infrastructure that pumps water to 80% of Arizona’s population,” said Rep. Paul Gosar (AZ-01). “With extremely high unemployment in my district, as well as the scarcity of water in Arizona, it is time we implement commonsense policies that allow our region to address our water and power needs, while also protecting the environment.”*

Instead of focusing on building new water storage and infrastructure, the Bureau of Reclamation is spending scarce taxpayer dollars on questionable projects. At a time when the federal government is running record budget deficits, Reclamation has funded dubious ventures such as toilet exchange programs, tiger salamander research, and “City Makeovers.”

<http://naturalresources.house.gov/>

[Facebook](#) | [YouTube](#) | [Twitter](#)

**From:** Bernhardt, David L.  
**Sent:** Thursday, March 3, 2011 3:11 PM  
**To:** TBirmingham@westlandswater.org  
**Subject:** Friday Call

Tom: I regret to inform you that I will not be able to participate on tomorrow's government affairs call. Unfortunately, I am going to be on a flight that I could not reschedule. I have asked Ken to participate in the call on our firm's behalf. If there is anything you wish to convey to me tomorrow, I will be available via email or phone after 11 a.m. Pacific time.

Best,  
David

David L. Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, D.C. 20005-3305  
*tel* 202.296.7353  
*fax* 202.296.7009

To ensure compliance with requirements imposed by the IRS, we inform you that any federal tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

This transmission and any attachment is attorney privileged and confidential. Any dissemination or copying of this communication is prohibited. If you are not the intended recipient, please notify us immediately by replying and delete the message. Thank you.

**From:** Tom Birmingham  
**Sent:** Thursday, March 3, 2011 3:18 PM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Friday Call

David,  
Not a problem. I presume I will see you next week.  
Tom

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Thursday, March 03, 2011 2:11 PM  
**To:** TBirmingham@westlandswater.org  
**Subject:** Friday Call

Tom: I regret to inform you that I will not be able to participate on tomorrow's government affairs call. Unfortunately, I am going to be on a flight that I could not reschedule. I have asked Ken to participate in the call on our firm's behalf. If there is anything you wish to convey to me tomorrow, I will be available via email or phone after 11 a.m. Pacific time.

Best,  
David

David L. Bernhardt  
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Washington, D.C. 20005-3305  
tel 202.296.7353  
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**From:** Bernhardt, David L.  
**Sent:** Thursday, March 3, 2011 3:35 PM  
**To:** Tom Birmingham  
**Subject:** RE: Friday Call

Absolutely.

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Thursday, March 03, 2011 5:18 PM  
**To:** Bernhardt, David L.  
**Subject:** RE: Friday Call

David,  
Not a problem. I presume I will see you next week.  
Tom

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Thursday, March 03, 2011 2:11 PM  
**To:** TBirmingham@westlandswater.org  
**Subject:** Friday Call

Tom: I regret to inform you that I will not be able to participate on tomorrow's government affairs call. Unfortunately, I am going to be on a flight that I could not reschedule. I have asked Ken to participate in the call on our firm's behalf. If there is anything you wish to convey to me tomorrow, I will be available via email or phone after 11 a.m. Pacific time.

Best,  
David

David L. Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
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Washington, D.C. 20005-3305  
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**From:** Bernhardt, David L.  
**Sent:** Monday, March 7, 2011 8:20 PM  
**To:** Jason Peltier; Thomas W. (Tom) Birmingham Esq.  
**Subject:** Fyi re Secretary Locke

POLITICO Breaking News  
-----

President Barack Obama has selected Commerce Secretary Gary Locke to succeed Jon Huntsman as U.S. ambassador to China, senior administration officials told POLITICO. He will make the announcement on Tuesday.

For more information... <http://www.politico.com>

=====  
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=====

**From:** Tom Birmingham  
**Sent:** Tuesday, March 8, 2011 9:54 AM  
**To:** 'Don Peracchi'; [REDACTED] joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** FW: Testimony

FYI

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Tuesday, March 08, 2011 8:47 AM  
**To:** 'Connor, Michael L'  
**Cc:** 'Glaser, Donald R'; 'Murray, Jaclyn'; 'Larrabee, Jason'  
**Subject:** Testimony

Mike,

I just read an article by E&E Reporter Paul Quinlan that reports you testified last week in a Reclamation budget hearing that the Central Valley farmer have not received a full water allocation "in more than 20 years." I know that media reports are not always accurate and that you would not intentionally mislead a House subcommittee, but if the report accurately characterizes you testimony, I believe your statement was erroneous. I believe that south-of-Delta CVP ag service contractors received a 100% allocation in 1995, 1998, and 2006. In 1996 and 1997 we received 95% and 90%, respectively, and in 2005 we received 90%. I am providing this information from memory, so please verify it with the regional staff.

Tom



**From:** Karen Clark

**Sent:** Friday, March 11, 2011 3:07 PM

**To:** Ed Manning; Carolyn Jensen; Doug Subers; joe.findaro@akerman.com; David L. Bernhardt

**CC:** Carmela McHenry

**Subject:** Conference Call to Discuss Washington DC Trip

All,

A conference call has been scheduled for Tom to visit with everyone regarding his recent trip to Washington DC for Tuesday, March 15 at 1:00 p.m. Pacific Standard Time.

Please use the following call-in information:

800-■■■■-■■■■ pass code ■■■■

If you have any questions, please contact me at ■■■■■■

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Friday, March 11, 2011 3:21 PM  
**To:** Karen Clark  
**Subject:** RE: Conference Call to Discuss Washington DC Trip

Thanks, Karen. I've noted the confirm details below on my folks' calendars.

Have a wonderful weekend! ☺

**Carmela McHenry**  
**KP PUBLIC AFFAIRS**

1201 K Street, Suite 800, Sacramento, CA 95814  
p. 916.448.2162 f. 916.448.4923  
w. [www.ka-pow.com](http://www.ka-pow.com) e. [cmchenry@ka-pow.com](mailto:cmchenry@ka-pow.com)

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---

**From:** Karen Clark [<mailto:kclark@westlandswater.org>]  
**Sent:** Friday, March 11, 2011 2:07 PM  
**To:** Ed Manning; Carolyn Jensen; Doug Subers; [joe.findaro@akerman.com](mailto:joe.findaro@akerman.com); David L. Bernhardt  
**Cc:** Carmela McHenry  
**Subject:** Conference Call to Discuss Washington DC Trip

All,

A conference call has been scheduled for Tom to visit with everyone regarding his recent trip to Washington DC for Tuesday, March 15 at 1:00 p.m. Pacific Standard Time.

Please use the following call-in information:

800-████-████ pass code █████

If you have any questions, please contact me at █████

Sincerely,

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier

**Sent:** Friday, March 11, 2011 3:32 PM

**To:** 'Ara Azhderian'; 'B J Miller'; 'Becky Sheehan'; 'Brent Walthall'; 'Byron Buck (Work)'; 'Cindy Kao'; 'Curtis Creel'; 'Dan O'Hanlon'; 'Eileen M. Diepenbrock'; 'Gregory Wilkinson'; 'Jon Rubin'; 'Laura King Moon'; 'Laura Simonek'; 'Linus Masouredis'; 'Lloyd Fryer'; 'Paul Weiland'; 'Robert Sawyer'; 'Scott Hamilton'; 'Sheila Greene'; 'Steve Anderson'; 'Terry Erlewine'; 'Tom Mongan'; 'Valerie Connor'; 'Craig Manson'; David Bernhardt

**Subject:** rip-off

## Another box car in the environmental gravy train?

By DAN KEPPEN

Guest writer

Herald and News

March 11, 2011

The Herald and News has provided good recent coverage on the petition submitted by four environmental groups to the National Marine Fisheries Service asking for protection of the "spring-run" Upper Klamath chinook salmon under the Endangered Species Act.

What has not been covered to date is the known track record and motives of one of the groups who submitted the petition - the Center for Biological Diversity.

There are many unknowns swirling around the mysterious "spring-run" chinook, including questions about reliable DNA data that would justify separating the spring-run from the overall chinook run on the Klamath River.

What is known, however, is that this latest attempt to add yet another single "distinct species" to the Endangered Species Act is nothing new for Center for Biological Diversity. Unfortunately, the organization's petition on the Klamath is just another in a long series of actions that suggests money - and not a desire to protect fish - is the real reason behind their latest action.

Two years ago, Budd-Falen law offices of Cheyenne, Wyo., set out to determine the amount of litigation filed by environmental organizations and the amount of attorneys' fees these groups have received from the federal government for these cases.

The results are shocking, and they only include federal district court cases.

Between 2000 and 2009, eight environmental groups - led by the Center for Biological Diversity - filed at least 1,596 federal court cases against the federal government. Every one of the groups is a tax-exempt, nonprofit organization that receives attorney fees from the federal government ... for suing the federal government. These same environmental groups are receiving billions of tax dollars in attorney fees for settling or "winning" cases against the federal government.

What was found

Based on the limited information that was available, Budd-Falen found that over \$4.7 billion in total payments were paid in taxpayer dollars from 2003 through July 2007 for attorney fees and costs in cases against the federal government. The Center for Biological Diversity alone has filed 149 cases in

the four federal district courts in California, all of which have been decided in a nine-year period ending in 2009.

Of those cases, the federal government stipulated to payment of attorneys fees in 74 cases. Of the 59 cases where fees were disclosed, the Center for Biological Diversity was awarded over \$3.6 million in attorney's fees and costs.

According to data collected by the Congressional Research Service, the Center for Biological Diversity also seems to have spearheaded the effort to use the ESA to enforce its global warming beliefs.

The organization has a list of 350 species it believes should be listed and critical habitat designated under the ESA to protect them from greenhouse gases and global warming. Just between five states and the District of Columbia, the Center for Biological Diversity has amassed over \$6.7 million in attorneys fees, all paid by taxpayers.

The vast majority of these cases were suits over the failure of the federal government to "timely" respond to the Center for Biological Diversity's ESA listing petitions. The real rub is that these types of litigious environmental groups are not asking the federal court to decide whether a species is scientifically threatened or endangered or whether greenhouse gases adversely impact the species; the majority litigation is only over the timing of the federal government's decisions or the process used to make the decisions.

Funds awarded to the "prevailing" litigants are taken from the "losing" federal agencies' budget. There is no oversight in spending this money, which could otherwise be funding on-the-ground programs to protect public lands, national forests, wildlife, other land uses - and yes, farmers and ranchers. Instead, nonprofit, tax exempt groups are making billions of dollars, while ranchers and other citizens are being forced to expend millions of their own money to intervene or participate in these lawsuits to protect their way of life when they have no chance of the same attorney fee recovery if they prevail.

So - don't be swayed by the alarmist message coming out of the Center for Biological Diversity, Oregon Wild and other groups who claim to be looking out for "species who cannot talk."

The real motivation here may be one of raking in clams instead of protecting fish.

## **The author**

Dan Keppen is executive director of the Family Farm Alliance, an organization headquartered in Klamath Falls that works in behalf of family farms and their relations with governmental bodies, especially dealing with water.

---

**From:** Ara Azhderian [mailto:ara.azhderian@sldmwa.org]

**Sent:** Wednesday, March 09, 2011 2:25 PM

**To:** Ara Azhderian; B J Miller; Becky Sheehan; Brent Walthall; Byron Buck (Work); Cindy Kao; Curtis Creel; Dan O'Hanlon; Eileen M. Diepenbrock; Gregory Wilkinson; Jason Peltier; Jon Rubin; Laura King Moon; Laura Simonek; Linus Masouredis; Lloyd Fryer; Paul Weiland; Robert Sawyer; Scott Hamilton; Sheila Greene; Steve Anderson; Terry Erlewine; Tom Mongan; Valerie Connor

**Subject:** RE: And here we go again...

OK... we will have a brief conference call this **Friday at 2pm** to organize our **Longfin comment effort**. The agenda basically is:

- 1) Assess what we have in the can from previous comment letters (Lloyd will distribute our last joint letter from March 2009).
- 2) Identify who will investigate changes in science since then.
- 3) Identify who will investigate changes in case law since then.
- 4) Establish a production schedule.

Dial-in:  
866-661-7061  
5434876#

We look forward to your participation.

Ara

---

**From:** Byron Buck [mailto:BBuck@sfcwa.org]  
**Sent:** Wednesday, March 09, 2011 11:00 AM  
**To:** Ara Azhderian; Ifryer@l-squared.com; Valerie Connor; Jason Peltier; Sheila Greene; B J Miller; Tom Mongan; Cindy Kao; Brent Walthall; Laura Simonek; Becky Sheehan; Linus Masouredis; Jon Rubin; Dan O'Hanlon; Gregory Wilkinson; Scott Hamilton; Terry Erlewine; Paul Weiland  
**Cc:** Valerie Connor  
**Subject:** RE: And here we go again...

If Lloyd has time to do this I am all for it. I don't need to be in the engine room here (too hot).

Byron Buck  
Executive Director  
State and Federal Contractors Water Agency  
916.476.5052  
[REDACTED] cell  
1121 L St. Suite 802  
Sacramento, CA 95811

---

**From:** Ara Azhderian [mailto:ara.azhderian@sldmwa.org]  
**Sent:** Wednesday, March 09, 2011 10:44 AM  
**To:** Ifryer@l-squared.com; Byron Buck; Valerie Connor; Jason Peltier; Sheila Greene; B J Miller; Tom Mongan; Cindy Kao; Brent Walthall; Laura Simonek; Becky Sheehan; Linus Masouredis; Jon Rubin; Dan O'Hanlon; Gregory Wilkinson; Scott Hamilton; Terry Erlewine; Paul Weiland  
**Subject:** RE: And here we go again...

Thanks Lloyd,

There are science and legal issues related to this re-evaluation. I know everyone is swamped but perhaps a coordination call to determine what we already have by way of response, what we need to develop, who's on point, etc. is in order. I could work with Byron to establish and would suggest Friday for possible times... thoughts?

Ara

---

**From:** Ifryer@l-squared.com [mailto:Ifryer@l-squared.com]  
**Sent:** Wednesday, March 09, 2011 10:42 AM  
**To:** Ara Azhderian; Byron Buck (Work); Valerie Connor; Jason Peltier; Sheila Greene; B J Miller; Tom Mongan; Cindy Kao; Brent Walthall; Laura Simonek; Becky Sheehan; Linus Masouredis; Jon Rubin; Dan O'Hanlon; Gregory Wilkinson; Scott

Hamilton; Terry Erlewine; Paul Weiland

**Subject:** RE: And here we go again...

Ara and others,

What will probably figure prominently in this next finding is the genetic work that shows the Bay-Delta and Lake Washington populations have slight genetic differences. This does not prove the Bay-Delta population is a DPS, but may prove that the Lake Washington population is. The Lake Washington population is physically isolated from the ocean whereas the Bay-Delta population is not. Because they are genetically isolated, the Lake Washington population cannot reliably be used to compare with any other population of longfin.

Lloyd

---

**From:** Ara Azhderian [mailto:ara.azhderian@sldmwa.org]

**Sent:** Wednesday, March 09, 2011 10:32 AM

**To:** Byron Buck (Work); Valerie Connor; Ifryer@l-squared.com; Jason Peltier; Sheila Greene; B J Miller; Tom Mongan; Cindy Kao; Brent Walthall; Laura Simonek; Becky Sheehan; Linus Masouredis; Jon Rubin; Dan O'Hanlon; Gregory Wilkinson; Scott Hamilton; Terry Erlewine; Paul Weiland

**Subject:** And here we go again...

U.S. Fish and Wildlife Service Announces Opening of 30-day Longfin Smelt Comment Period

Ara

# News Release

March 9, 2011

Contact: Steve Martarano, (916) 930-5643, [steve\\_martarano@fws.gov](mailto:steve_martarano@fws.gov)

## U.S. Fish and Wildlife Service Announces Opening of 30-day Longfin Smelt Comment Period

SACRAMENTO –The U.S. Fish and Wildlife Service today announced it will accept comments through April 9, 2011 regarding a status review of the longfin smelt. To ensure that the status review is comprehensive, the Service is soliciting scientific and commercial data, as well as other information regarding this species. Based on the status review, the Service will issue a final 12-month finding by Sept. 30, 2011 that will address whether the listing may be warranted under the Endangered Species Act.

The complete *Federal Register* filing can be found at  
[http://www.ofr.gov/OFRUpload/OFRData/2011-05424\\_PL.pdf](http://www.ofr.gov/OFRUpload/OFRData/2011-05424_PL.pdf)

Interested parties may submit comments by one of the following methods:

*Federal eRulemaking Portal:* <http://www.regulations.gov>. Search for Docket No. FWS-R8-ES-2011-0008 and then follow the instructions for submitting comments.

*U.S. mail or hand-delivery:* Public Comments Processing, Attn: FWS-R8-ES-2011-0008; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax

Drive, Suite 222; Arlington, VA 22203.

All information received will be posted on <http://www.regulations.gov>.

The longfin smelt is a pelagic (lives in open water) estuarine fish that typically measures 3.5 to 4.3 inches standard length, although third-year females may grow up to 5.9 inches. The known range of the longfin smelt extends from the San Francisco Bay-Delta in California northward to the Cook Inlet in Alaska. The longfin smelt belongs to the true smelt family *Osmeridae*, and is one of three species in its genus.

On Aug. 8, 2007, the Service received a petition from the Bay Institute, the Center for Biological Diversity, and the Natural Resources Defense Council to list the San Francisco Bay-Delta population of the longfin smelt as a distinct population segment (DPS) and designate critical habitat for the species concurrent with the listing. On May 6, 2008, the Service published a 90-day finding which concluded that the petition provided substantial information indicating that listing San Francisco Bay-Delta Population of the longfin smelt as a DPS may be warranted, and a status review was initiated. On April 9, 2009, the Service published a 12-month finding and determined that the San Francisco Bay-Delta population of the longfin smelt did not meet the discreteness criterion of the DPS policy and therefore is not a valid DPS. A news release on the 2009 finding can be found at:

([http://www.fws.gov/sacramento/ea/news\\_releases/2009\\_News\\_Releases/longfin\\_smelt\\_12mo\\_finding\\_NR.htm](http://www.fws.gov/sacramento/ea/news_releases/2009_News_Releases/longfin_smelt_12mo_finding_NR.htm)).

On Nov. 13, 2009, the Center and the Bay Institute filed a complaint in U.S. District Court for the Northern District of California, challenging the Service on the merits of the 2009 determination. On Feb. 2, 2011, the parties agreed to a settlement to complete a new 12-month finding on the longfin smelt, based on the rangewide status review of the longfin smelt that is currently underway. If the Service determines in the course of the status review that the longfin smelt does not warrant listing rangewide, the Service will, in the same 12-month finding, consider whether any population of longfin smelt qualifies as a DPS. In considering whether any population of longfin smelt qualifies as a DPS, the Service will also reconsider whether the San Francisco Bay-Delta population of the longfin smelt constitutes a DPS.

**FOR FURTHER INFORMATION CONTACT:** Field Supervisor, Bay-Delta Fish and Wildlife Office, 650 Capitol Mall, Eighth Floor, Sacramento, CA 95814; by telephone at 916-930-5603; or facsimile at 916-930-5654. Persons who use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339

The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people. We are both a leader and trusted partner in fish and wildlife conservation, known for our scientific excellence, stewardship of lands and natural resources, dedicated professionals and commitment to public service. For more information on our work and the people who make it happen, visit [www.fws.gov](http://www.fws.gov).

###

Steve Martarano, Public Affairs Specialist  
Bay-Delta Office, Fish and Wildlife Service

650 Capitol Mall, Eighth Floor  
Sacramento, CA 95814

Office -- 916-930-5643

Cell - 916-████-████

Check out the BDFWO web page at  
<http://www.fws.gov/sfbaydelta/>



**From:** Jason Peltier

**Sent:** Wednesday, March 23, 2011 11:13 AM

**To:** joe. findaro@akerman. com; David Bernhardt; Kiel Weaver (Kiel. weaver@mail. house. gov)

**Subject:** Fwd: Hearing

Update from fed court this am.

Begin forwarded message:

**From:** "Dan Nelson" <[dan.nelson@sldmwa.org](mailto:dan.nelson@sldmwa.org)>

**Date:** March 23, 2011 10:52:56 AM PDT

**To:** "Frances Mizuno" <[frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org)>, "Ara Azhderian" <[ara.azhderian@sldmwa.org](mailto:ara.azhderian@sldmwa.org)>, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>

**Subject:** RE: Hearing

Sure.

We've done opening statements and now have Erlewine on the stand.

We contended that we would show that science is flawed; impacts are real. Feds contend supply is much better; impacts are over stated; and that science support is solid, especially with the steelhead. Ironically feds are claiming that there's so much water and that the allocations are so much better that there isn't any problem.

Erlewine doing well.

More to follow.

Sent with Good ([www.good.com](http://www.good.com))

-----Original Message-----

From: Frances Mizuno

Sent: Wednesday, March 23, 2011 10:13 AM Pacific Standard Time

To: Dan Nelson

Subject: Hearing

Dan-

If you're at the hearing, can you keep me updated as to the progress? Thanks.

Frances

**From:** Jason Peltier

**Sent:** Monday, March 28, 2011 5:39 AM

**To:** David Bernhardt; Ara Azhderian; Bill Kahrl (bkahrl@westlandswater.org); joe.findaro@akerman.com

**Subject:** Fwd: No subject

Begin forwarded message:

**From:** "Terry Erlewine" <[terlewine@swc.org](mailto:terlewine@swc.org)>

**Date:** March 27, 2011 12:05:04 PM PDT

**To:** "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>

[http://www.deltacouncil.ca.gov/delta\\_science\\_program/events/workshop\\_OCAP\\_2010.html](http://www.deltacouncil.ca.gov/delta_science_program/events/workshop_OCAP_2010.html)

Sent from Samsung mobile

**From:** Tom Birmingham  
**Sent:** Tuesday, March 29, 2011 2:40 PM  
**To:** 'Craig Manson'; 'Bernhardt, David L.'  
**CC:** 'Weaver, Kiel'  
**Subject:** Questions for Dick Poole

Kiel Weaver asked for some help developing questions for Dick Poole, who will testify at a hearing on April 5. I told him that the two of you would be happy to help. Please expect a call from Kiel.

**From:** Karen Clark

**Sent:** Thursday, March 31, 2011 9:09 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

**Importance:** High

All,

Tom needs to reschedule this call (if possible) to 10:00 a.m. PST tomorrow (Friday, April 1). Could you please let me know if you'll be able to participate?

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[\*kclark@westlandswater.org\*](mailto:kclark@westlandswater.org)

**From:** Bernhardt, David L.  
**Sent:** Thursday, March 31, 2011 9:11 AM  
**To:** Karen Clark  
**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

yes

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, March 31, 2011 12:09 PM  
**To:** Tony Coelho; Bill Kahr; Carmela McHenry; Carolyn Jensen; Bernhardt, David L.; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow  
**Importance:** High

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Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Thursday, March 31, 2011 9:13 AM  
**To:** Karen Clark  
**CC:** Ed Manning; Carolyn Jensen; Doug Subers  
**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

Hi Karen:

As of today, 10 AM (PST) tomorrow (4/1) works on the calendars for the KP team.

Thanks.

*Carmela McHenry*

(Direct) 916-498-7711  
(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, March 31, 2011 9:09 AM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow  
**Importance:** High

All,

Tom needs to reschedule this call (if possible) to 10:00 a.m. PST tomorrow (Friday, April 1). Could you please let me know if you'll be able to participate?

Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carolyn Jensen

**Sent:** Thursday, March 31, 2011 9:13 AM

**To:** kclark@westlandswater.org; tony@onewharf.com; bkahrl@westlandswater.org; Carmela McHenry; dbernhardt@bhfs.com; Doug Subers; Ed Manning; gholman@westlandswater.org; jpeltier@westlandswater.org; joe.findaro@akerman.com; sgreene@westlandswater.org; sramos@westlandswater.org

**Subject:** Re: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

I can make 10:00am.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Thursday, March 31, 2011 09:09 AM

**To:** Tony Coelho <tony@onewharf.com>; Bill Kahrl <bkahrl@westlandswater.org>; Carmela McHenry; Carolyn Jensen; David Bernhardt <dbernhardt@bhfs.com>; Doug Subers; Ed Manning; Gayle Holman <gholman@westlandswater.org>; Jason Peltier <jpeltier@westlandswater.org>; Joe Findaro <joe.findaro@akerman.com>; Sheila Greene <sgreene@westlandswater.org>; Susan Ramos <sramos@westlandswater.org>

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*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Gayle Holman  
**Sent:** Thursday, March 31, 2011 9:14 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

10:00 AM is fine.

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

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**From:** Jason Peltier  
**Sent:** Thursday, March 31, 2011 9:18 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

Yes. works.

---

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**To:** Tony Coelho; Bill Kahl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
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**From:** Bernhardt, David L.  
**Sent:** Thursday, March 31, 2011 10:59 AM  
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**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

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David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Bernhardt, David L.  
**Sent:** Thursday, March 31, 2011 12:35 PM  
**To:** Karen Clark  
**Subject:** RE: Postponement of 7:30 a.m. PR/Legislation Conf. Call Tomorrow

Great.

David Longly Bernhardt  
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**From:** Tom Birmingham

**Sent:** Thursday, April 7, 2011 4:25 PM

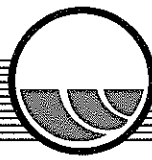
**To:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Ted Sheely'; 'Frank Coelho, Jr.'; 'Gary Esajian'; 'Larry Enos'; 'Todd Neves'

**CC:** 'Craig Manson'; 'Jason Peltier'; 'Bill Kahrl'; 'Bernhardt, David L.'; 'Mathews, Mark J.'; 'O'Hanlon, Daniel'

**Subject:** Letter to Senator Feinstein on Drainage

**Attachments:** SKMBT\_50011040716110.pdf

[The attached was sent today.](#)



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

April 7, 2011

The Honorable Dianne Feinstein  
United States Senate  
331 Hart Senate Office Building  
Washington, DC 20510

RE: Department of the Interior's Proposed Drainage Settlement

Dear Senator Feinstein:

At your request, I am writing to comment on the September 1, 2010, letter from Bureau of Reclamation ("Reclamation") Commissioner Michael Connor regarding resolution of the litigation concerning Reclamation's obligation to provide drainage service to the San Luis Unit of the Central Valley Project. In his letter, Commissioner Connor outlines the elements of legislation that the Department of the Interior ("Interior") would support to resolve this longstanding dispute. For the reasons described below, Westlands Water District does not support and would vigorously oppose legislation along the lines described by Commissioner Connor.

When Congress authorized the construction of the San Luis Unit in 1960, it imposed a mandatory duty on the Secretary of the Interior ("Secretary") to provide drainage service to the Unit. From almost the inception of the San Luis Unit there has been controversy and litigation surrounding this obligation. In 1963, Firebaugh Canal Water Company (now Firebaugh Canal Water District) and Central California Irrigation District sued the Secretary to compel the Secretary to provide drainage service. This litigation, and subsequent litigation filed by these entities in 1967, was dismissed after the Secretary provided assurances to the Court that he would comply with that mandate.

In March, 1968, construction of the San Luis Drain was initiated, and by 1975, approximately 82 miles of the Drain had been built. However, in 1975, the Secretary suspended construction of the Drain, citing "questions" and "concerns" raised in the public arena. Nonetheless, a subsurface drainage collector system was constructed in Westlands Water District and drainage service began in 1978. The subsurface collector drainage system discharged approximately 7,300 acre-feet annually of collected subsurface agricultural drainage into the portion of the Drain constructed prior to 1975. The Drain carried the drainage water to Kesterson Reservoir, which was constructed by the Secretary as a regulating reservoir for the Drain en route to its planned terminus in the Delta but which became the de facto terminus of the Drain.

In mid-1983, waterfowl nesting studies at Kesterson Reservoir revealed instances of embryo deformity and mortality. It was suspected that selenium, a natural occurring trace element, was being leached from soils in that portion of Westlands being served by the Drain and carried with drainage water into Kesterson Reservoir and was concentrating in biota. In March 1985, the Secretary announced that Interior would close the Reservoir, and to that end, the subsurface collector drainage system in Westlands was plugged and the Drain was closed as of June 1986.

Affected landowners, both inside and outside of Westlands, sued the Interior seeking an order compelling the Secretary to provide drainage service. Westlands was also named a defendant in the litigation brought by landowners within the District. In that case, Westlands filed a cross-claim against the Secretary asserting that Interior had a mandatory duty to provide drainage service and was liable for any harm caused by his failure to provide such service. In the litigation brought by landowners outside of the District, Westlands intervened as a defendant. In May of 1992, these lawsuits were partially consolidated to resolve the plaintiffs' and Westlands' mutual allegation that Interior was required by law to provide drainage service to the San Luis Unit.

In 1995, after a lengthy trial, the District Court for the Eastern District of California held that the San Luis Act does impose a mandatory duty on the Secretary to provide drainage service to the Unit, and the Court ordered Interior to do those things necessary to pursue a discharge permit for the Drain to comply with the statutory duty to provide drainage service. In February 2000, the U.S. Court of Appeals for the Ninth Circuit affirmed the District Court's judgment that the San Luis Act imposes on the Secretary a mandatory duty to provide drainage service to the San Luis Unit, but held that the Secretary has discretion concerning the means by which that obligation will be met. The District Court subsequently modified its mandatory injunction to conform to the decision of the Court of Appeals and order Interior to, without delay, provide drainage service to the San Luis Unit.

In 2001 Reclamation developed a Plan of Action outlining its proposed efforts to provide drainage service, considering a variety of options, and in December 2001, Reclamation published its Preliminary Alternatives Report, San Luis Unit Drainage Feature Re-evaluation. In December 2002, Reclamation published a Plan Formulation Report, San Luis Drainage Feature Re-evaluation, and in 2004, Reclamation prepared an Amended Plan of Action, which stated that Reclamation would continue to refine and evaluate all five alternatives described in the Plan Formulation Report for inclusion in an environmental impact statement. In May 2006, Reclamation filed the *Final Environmental Impact Statement, San Luis Drainage Feature Re-evaluation* that identified two in-valley alternatives for further feasibility analysis. In March 2007, Reclamation issued a Record of Decision for the San Luis Drainage Feature Re-evaluation, in which Reclamation selected the In-Valley/Water Needs/Land Retirement Alternative for implementation.

Prior to adoption of the Record of Decision, Reclamation approached Westlands about the potential of finding alternative means of addressing the San Luis Unit drainage issue because it had become apparent to Reclamation that it would cost in excess of \$2.6 billion to implement the alternative that it was likely to adopt. Reclamation was concerned that it would not be able to

obtain authorization or appropriations necessary to implement this alternative, and it suggested that Westlands and other affected water districts engage in a collaborative process to develop a proposal for contractor managed drainage service. After preliminary discussions, Reclamation, Westlands, and the other San Luis Unit contractors agreed to this process, which would be concurrent with completion of the Record of Decision and be governed by five basic principles:

- Provide a timely solution to the drainage problem
- Sustain agriculture in the San Joaquin Valley
- Eliminate the drainage obligation and any potential liability to the United States
- Provide benefits to the environment
- Eliminate the need for Federal funding

Negotiations among Reclamation, Westlands, and the other San Luis Unit contractors resulted in a proposal under which:

- Each San Luis Unit contractor would assume the obligation for drainage service in its respective service area;
- The Secretary of the Interior would be relieved of any further obligation to provide drainage service;
- Each San Luis Unit contractor would be relieved of its obligation to repay Central Valley Project capital costs;
- Title to joint use facilities of the San Luis Unit would be transferred to a joint powers authority comprised of San Luis Unit and San Felipe contractors and the State of California;
- The United States would assign to a joint powers authority comprised of the San Luis Unit contractors California Water Rights Permit No. 12860;
- San Luis Unit contractors would no longer be subject to the pricing and acreage limitations of federal reclamation law;
- Water service contracts, totaling approximately 30,000 acre-feet, acquired by Westlands would be assigned to the Fish and Wildlife Service; and,
- The United States would be held harmless for any damages resulting from the Secretary's failure to provide drainage service.

This proposal was made public by Reclamation, Westlands, and the other San Luis Unit contractors in the fall of 2006, and the reaction from other agencies and non-governmental



organizations was swift and negative. The elements of this proposal that would have resulted in assignment of title to the San Luis Unit facilities and water rights to a joint powers authority were of particular concern to other water agencies and non-governmental organizations. Shortly thereafter, you initiated the discussions, referenced in Commissioner Connor's letter, among Interior, Westlands, and other interested parties in an attempt to find an alternative approach to solving the drainage issue that would avoid the need for further litigation and the need to appropriate \$2.7 billion dollars over a ten year period.

During those discussions Westlands attempted to be flexible, within reason. When concerns were raised about the assignment of water rights permit no. 12860 to the San Luis Unit contractors, which would have resulted in a permanent water supply, Westlands agreed to accept a section 9(d) contract (similar to the arrangement made with Friant Division contractors). When concerns were raised about drainage impaired lands previously purchased by Westlands going back into irrigated production, Westlands agreed to permanently retire all of those lands. When concerns were raised about the "pay-go" effects of relieving Westlands of its entire Central Valley Project capital obligation, Westlands agreed to make the proposal "pay-go" neutral by pre-paying that obligation, at a discounted rate. When concerns were raised about the limited quantity of water being assigned to the Fish and Wildlife Service, Westland agreed to assign, at no cost, 100,000 acre-feet of its existing contract quantity to the Service. When concerns were raised about the efficacy of the drainage plan Westlands proposed to implement, Westlands agreed to performance standards that would be monitored by the California Regional Water Quality Control Board. Finally, in the fall of 2008, after Westlands said "enough," Representatives Jim Costa and Dennis Cardoza and you requested that Reclamation draft legislation to authorize the alternative as it was then understood by Reclamation and Westlands.

In his letter to you, Commissioner Connor states it was unfortunate that the process you initiated "did not result in a consensus draft bill." Westlands does not believe that it was ever anyone's expectation that there would be consensus on this extraordinarily controversial issue. Rather, Westlands understood that the request to draft legislation was made because it was your view that after two years of discussions it was unreasonable to ask Westlands to make additional accommodations. This does not mean that Westlands understood that you would introduce legislation to authorize the settlement. To the contrary, you were explicit that your decision concerning introduction of the legislation would be made only after the bill was drafted. But if there were consensus on anything, it was that not everyone involved in your process would agree on the content of the draft legislation.

In his letter to you Commissioner Connor also states that Interior would support a legislative solution that included a number of "key elements," many of which differ significantly from the proposal on which Reclamation and Westlands tentatively agreed. Among these differences is that "Westlands should be required to permanently retire a minimum of 200,000 acres of the most drainage impaired lands as part of the required drainage management plan." This element is unacceptable to Westlands for a number of reasons. First, under this proposal if Westlands were unable to acquire sufficient additional lands from willing sellers, it would be required to condemn land from unwilling sellers. Moreover, the cost of implementing a drainage program

would not be proportionately reduced by taking these additional lands out of production, and the retirement of these additional lands would diminish the capacity of the District to pay the costs of implementing a drainage solution. In other words, the number of acres paying for implementation of a drainage program would be reduced by 100,000 acres, and the amount paid by the acreage remaining in production would be significantly increased. Finally, the purpose of providing drainage service is to protect the arability of the land. Taking land out of production is inconsistent with that objective.

It is plain from the Commissioner's letter that the objective of requiring the retirement of at least 200,000 acres is to achieve a reduction under Westlands' water service contract. Commissioner Connor's letter states:

Upon development of a plan that will permanently retire 200,000 acres (approximately 30 percent of the agricultural lands in the district), CVP water under long-term contract to Westlands should be reduced to an annual amount of 806,000 acre feet of Project Water for irrigation (which is 70 percent of the amount provided in the existing water service contract) to bring it into balance with the amount of land remaining in production.

This element of Interior's current proposal ignores the rationale for Reclamation's selection of the alternative selected by the Record of Decision, the "In Valley/Water Needs Land Retirement Alternative." This alternative included the retirement of 194,000 acres of land in Westlands and was selected by Reclamation, in part, because it would balance the demand for water in Westlands with its existing supply. Stated succinctly, the retirement of one-third of the acres in Westlands would not equate to a one-third reduction in demand for water under the District's existing water service contract. The retirement of 200,000 acres in Westlands would leave approximately 400,000 acres in production. Assuming a very conservative demand of 2.5 acre-feet per acre, demand on these remaining lands would be 1 million acre-feet. But many acres in Westland are devoted to permanent crops, like almonds that require a minimum of 3.5 acre-feet per acre. In 2010, there were approximately 106,000 acres of permanent crops in Westlands, which represents a demand of at least 371,000 acre-feet. This one-quarter of the lands that would remain in production under the proposal described in Commissioner Connor's letter would demand 46% of the supply available under the contract described by Commissioner Connor.

It is also plain from Commissioner Connor's letter that Interior's interest in reducing the quantity of water under Westlands contract by 400,000 acre-feet is to address the ecosystem collapse in the Delta. There is no question that ecosystem restoration in the Delta is an important issue and must be addressed. It is for precisely this reason that Westlands has supported the development of a habitat conservation plan for the Delta and has paid tens-of-millions of dollars towards that effort. However, the proposal developed by Reclamation and Westlands from 2006 through 2010 was intended to address a different environmental problem, drainage. Even assuming for purposes of argument that restoration of the Delta ecosystem requires a reduction of contract

The Honorable Dianne Feinstein

April 7, 2011

Page 6

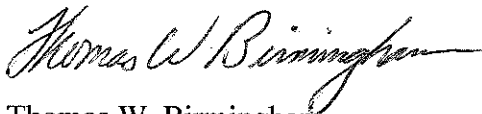
quantities for Central Valley Project contractors, the proposal described in Commissioner Connor's letter would impose a disproportionate burden on Westlands, and it is unacceptable.

Another "key element" of the proposal described by Commissioner Connor that differs significantly from the proposal developed jointly by Reclamation and Westlands is the character of the contract for water supply that results. Although Commissioner Connor's letter describes the resulting contract as a "repayment contract," it would lack an important attribute of the Section 9(d) contract contemplated by the proposal developed jointly by Reclamation and Westlands, a permanent water supply, such as was provided to Friant contractors. Under the contract described in Commissioner Connor's letter, Westlands would be required to spend in excess of \$800,000,000.00, with the potential that at the end of the repayment period of its debt, its water supply could be terminated. No reasonable person would accept this potential.

From Westlands' perspective the proposal described in Commissioner Connor's letter can be summarized as follows: Westlands has a judgment against the Secretary ordering him to provide drainage. The government estimates that it will cost \$2.6 billion to comply with that order. But as an alternative, Reclamation proposes: (1) that the obligation to provide drainage be transferred to Westlands; (2) that if Westlands does not perform this obligation (something Reclamation has been unable to do for 40 years) its water supply will be reduced; (3) that Westlands must retire 200,000 acres of land at its expense; and, (4) that for the privilege of undertaking these obligations and risks, Westlands will give up 400,000 acre-feet of contract supply. This proposal is unacceptable.

Westlands appreciates greatly your continued efforts to resolve this important issue, which threatens the viability of irrigated agriculture in large areas of the San Joaquin Valley, and it is committed to finding a viable solution that serves the interests of all interested parties.

Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Jim Costa  
Commissioner Michael Connor

**From:** Jason Peltier

**Sent:** Sunday, April 10, 2011 9:19 AM

**To:** joe.findaro@akerman.com; 'Bernhardt, David L.'; 'Ed Manning'; 'Carolyn Jensen'; 'Ken Khachigian'; 'Tony Coelho'

**CC:** 'Tom Birmingham'

**Subject:** Hearing politics

## Politics muddies water hearing in Fresno

Valley lawmakers bicker over event.

Posted at 08:53 PM on Saturday, Apr. 09, 2011

By Michael Doyle / Bee Washington Bureau

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WASHINGTON -- Backstage drama has unsettled a congressional hearing on California water scheduled Monday in Fresno.

The morning hearing's troubled history underscores increasingly bitter divisions among San Joaquin Valley lawmakers.

"The Democrats only want extreme environmentalists [as witnesses]," Rep. Devin Nunes, R-Visalia, said Friday, "and the Valley Democrats have no clout in their own conference."

One of those Democrats, Rep. Jim Costa of Fresno, said Friday that Nunes saw only "political opportunism" in the upcoming hearing.

"For Devin Nunes, it's about politics," Costa said. "He doesn't want to cooperate with us to solve the problem."



Jim Costa

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The House water and power subcommittee hearing started out with black-and-white intentions -- tellingly titled "Creating Jobs by Overcoming Man-Made Drought," the session was supposed to make the case for increased water deliveries.

The subcommittee chairman, Rep. Tom McClintock, R-Granite Bay, stressed his priorities at a hearing last week when he denounced environmentalists' "radical and retrograde ideology" and "government-induced shortages."

"We can return abundance as the central objective of our water and power policy," McClintock said.

Once onstage at Fresno City Hall, the hearing's 10 scheduled witnesses would likewise articulate familiar viewpoints.

Witnesses including Kern County Water Agency general manager Jim Beck and Fresno County supervisor and former farm bureau president Phil Larsen are prepared to speak about the pain of diminished water supplies.

The reduced water deliveries stem in part from environmental protections for fish that rely on the Sacramento-San Joaquin Delta. This year, farmers south of the Delta will receive 75% of their contractual amounts.

Last year, they received 45%.

Substantively, the reduced deliveries have united many Republicans and Democrats in anger.

Behind the scenes, though, bickering over who testifies poisoned hearing preparations and exacerbated an existing split within the Valley's congressional delegation.

For the Fresno hearing, Republicans could invite more witnesses than Democrats.

This kind of partisan stacking is typical for congressional hearings.

But for reasons that are open to dispute, neither Republicans nor Democrats initially invited a representative of Westlands Water District.

It was a stunning omission -- an insult, even -- for a hearing held in Westlands' own backyard. The 600,000-acre water district is the nation's largest.

Democrats said they expected Republicans to extend the invitation, since it was a GOP-run hearing. Republicans insist Democrats should have extended the invitation, since the district is represented by Costa.

The subcommittee's senior Democrat, Rep. Grace Napolitano of Santa Fe Springs, had instead selected a Contra Costa County supervisor and a fishing industry representative. Napolitano is not an ally of Westlands.

"Their religion is extreme environmentalism," Nunes said of the Democrats.

But Nunes, though far removed from Napolitano politically, has likewise clashed in the past with Westlands, for different reasons.

However it happened, Westlands was not on the hearing list.

In an unusual move, Costa and Rep. Dennis Cardoza, D-Merced, finally wrote McClintock to ask that Westlands General Manager Tom Birmingham be added as an extra witness.

Two days later, Nunes and Rep. Jeff Denham, R-Atwater, wrote in their own letter that a "well-respected and knowledgeable representative" of the Valley's west side should be added.

The subcommittee finally added Birmingham as a witness, for which both the Republicans and Democrats sought to take respective credit.

"It wasn't easy," Cardoza said of the hearing preparations.

Read more: <http://www.fresnobee.com/2011/04/09/2344127/politics-muddies-water-hearing.html#ixzz1J8a4y7VT>

**From:** Weaver, Kiel  
**Sent:** Tuesday, April 12, 2011 12:22 PM  
**To:** 'Tom Birmingham'  
**Subject:** RE: Thank You

Tom,

The hearing wouldn't have been the success it was without you there. You have that blessing that few very people of your background have: the ability to simplify complex material into concise and understandable language. Just so you know, Larry Collins asked me if it was a sick joke that I put you two next to each other. I just smiled in return.

Now the hard part of writing a bill(s) is the next step. I will likely seek your advice on things, outside of SJRR.

In the meantime, I think we need to reconcile some of the take numbers allowed by the USGS. We have two different sets – one from you and one from Bernhardt. Stay tuned on that as you will soon be asked to edit a draft letter in the next few days.

Sorry you had to go through the witness drama, but ultimately your appearance had much to do hearing success. Thanks

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Monday, April 11, 2011 5:21 PM  
**To:** Weaver, Kiel  
**Subject:** Thank You

Kiel,

I still would like to have that beer to discuss the background of my invitation, but I know your advice to the Chairman was instrumental in me being invited. Thank you for everything you did to help and for everything you do to try and resolve this crisis. I hope I contributed to the outcome of the hearing.

Thank you,  
Tom

**From:** Karen Clark

**Sent:** Thursday, April 14, 2011 8:17 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conference Call on April 15

All,

We will have a PR/Legislation conference call tomorrow, April 15 at 7:30 a.m. PST.

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** joe.findaro@akerman.com  
**Sent:** Thursday, April 14, 2011 8:30 AM  
**To:** kclark@westlandswater.org  
**Subject:** RE: PR/Legislation Conference Call on April 15

thanks. will be on.

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---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, April 14, 2011 11:17 AM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Findaro, Joe (OC-DC); Sheila Greene; Susan Ramos  
**Subject:** PR/Legislation Conference Call on April 15

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Sincerely,

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*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Ed Manning

**Sent:** Thursday, April 14, 2011 8:32 AM

**To:** kclark@westlandswater.org; tony@onewharf.com; bkahrl@westlandswater.org; Carmela McHenry; Carolyn Jensen; dbernhardt@bhfs.com; Doug Subers; gholman@westlandswater.org; jpeltier@westlandswater.org; joe.findaro@akerman.com; sgreene@westlandswater.org; sramos@westlandswater.org

**Subject:** Re: PR/Legislation Conference Call on April 15

I will be in Boston visiting colleges with my daughter and will not be able to join the call. I will download to Carolyn in advance. Thanks.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Thursday, April 14, 2011 08:17 AM

**To:** Tony Coelho <tony@onewharf.com>; Bill Kahrl <bkahrl@westlandswater.org>; Carmela McHenry; Carolyn Jensen; David Bernhardt <dbernhardt@bhfs.com>; Doug Subers; Ed Manning; Gayle Holman <gholman@westlandswater.org>; Jason Peltier <jpeltier@westlandswater.org>; Joe Findaro <joe.findaro@akerman.com>; Sheila Greene <sgreene@westlandswater.org>; Susan Ramos <sramos@westlandswater.org>

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*Westlands Water District*

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*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Monday, April 25, 2011 10:50 AM  
**To:** David Bernhardt; joe.findaro@akerman.com  
**Subject:** NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

**Importance:** High

Hello David and Joe,

I am sorry, but this call is back on for April 28 at 9:00 a.m. PST. Tom is not going to be able to participate, but Ed Manning and Western Growers would still like to have the call. Would you let me know if you are still available?

Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, April 22, 2011 8:47 AM  
**To:** 'David Bernhardt';joe.findaro@akerman.com'  
**Subject:** Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

David and Joe,

We will not have a call on Thursday, April 28 at 9:00 a.m. PST to discuss Tom's trip to DC with representatives from Western Growers and KP Communications. Tom has to be at a hearing that day with Judge Wanger. I'll be in touch with you to reschedule.

Thanks!

~Karen

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*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
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*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Monday, April 25, 2011 10:51 AM  
**To:** kclark@westlandswater.org; dbernhardt@bhfs.com  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

sure. noon our time. how long is call ?

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---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Monday, April 25, 2011 1:50 PM  
**To:** David Bernhardt; Findaro, Joe (OC-DC)  
**Subject:** NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST  
**Importance:** High

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*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Monday, April 25, 2011 10:55 AM  
**To:** joe.findaro@akerman.com  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

I think an hour or so.

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
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**Sent:** Monday, April 25, 2011 10:51 AM  
**To:** kclark@westlandswater.org;dbernhardt@bhfs.com  
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---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Monday, April 25, 2011 1:50 PM  
**To:** David Bernhardt; Findaro, Joe (OC-DC)  
**Subject:** NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST  
**Importance:** High

Hello David and Joe,

I am sorry, but this call is back on for April 28 at 9:00 a.m. PST. Tom is not going to be able to participate, but Ed Manning and Western Growers would still like to have the call. Would you let me know if you are still available?

Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, April 22, 2011 8:47 AM  
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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Monday, April 25, 2011 10:57 AM  
**To:** kclark@westlandswater.org  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

thx

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Monday, April 25, 2011 1:55 PM  
**To:** Findaro, Joe (OC-DC)  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

I think an hour or so.

~Karen

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**From:** joe.findaro@akerman.com [mailto:joe.findaro@akerman.com]  
**Sent:** Monday, April 25, 2011 10:51 AM  
**To:** kclark@westlandswater.org;dbernhardt@bhfs.com  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

sure. noon our time. how long is call ?

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Karen: I could get on the call late, at about 9:30.

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
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**From:** Karen Clark  
**Sent:** Wednesday, April 27, 2011 8:44 AM  
**To:** Carmela McHenry  
**Subject:** FW: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

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~Karen

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Hi David,

That is fine. Thanks!

~Karen

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**From:** Carmela McHenry  
**Sent:** Wednesday, April 27, 2011 8:47 AM  
**To:** Karen Clark  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

Hi Karen:

Thanks for the FYI. The call is actually tomorrow (4/28) morning at 9 AM....not this morning. Will David still be joining at 9:30 AM?

*Carmela McHenry*

(Direct) 916-498-7711  
(Fax) 916-448-4923

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Sorry Carmela, I should drink more coffee this morning. To answer your question, yes, David will still be joining at 9:30 a.m. tomorrow. I'm the one that messed up the day :)

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**Sent:** Wednesday, April 27, 2011 9:22 AM  
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Pfffffffffffft.....no apologies necessary, Karen. Thanks for clarifying. ☺

I need some coffee myself...need to get that jump start.

*Carmela McHenry*

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**To:** Carmela McHenry  
**Subject:** FW: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST  
**Importance:** High

Hi Carmela,

David Bernhardt will be joining the 9:00 a.m. call this morning with Ed and Western Growers at about 9:30 a.m. (see below).

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Wednesday, April 27, 2011 7:25 AM  
**To:** Karen Clark  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

Karen: I could get on the call late, at about 9:30.

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Monday, April 25, 2011 1:50 PM  
**To:** Bernhardt, David L.; joe.findaro@akerman.com  
**Subject:** NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST  
**Importance:** High

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Thanks!

~Karen

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**Sent:** Friday, April 22, 2011 8:47 AM  
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**Subject:** Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

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**Sent:** Wednesday, April 27, 2011 11:34 AM  
**To:** Karen Clark  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

Karen: I can be on the call at 12.

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**From:** Karen Clark  
**Sent:** Wednesday, April 27, 2011 1:52 PM  
**To:** Bernhardt, David L.  
**Subject:** RE: NO Cancellation of Conf. Call on April 28 at 9:00 a.m. PST

Thanks, David.

~Karen

*Karen Clark*  
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**From:** Karen Clark

**Sent:** Thursday, April 28, 2011 9:44 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**CC:** Carmela McHenry

**Subject:** Conference Call Reminder for Tomorrow

All,

This is a reminder that we will have our 7:30 a.m. (PST) PR/Legislative conference call tomorrow morning.

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

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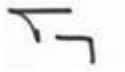
*(o) 559.241.6234*

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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Tony Coelho  
**Sent:** Thursday, April 28, 2011 1:23 PM  
**To:** 'Karen Clark'  
**Subject:** RE: Conference Call Reminder for Tomorrow

I will be on the call!



**Tony Coelho**

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, April 28, 2011 12:44 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Cc:** Carmela McHenry  
**Subject:** Conference Call Reminder for Tomorrow

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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Tom Birmingham  
**Sent:** Monday, May 9, 2011 7:34 AM  
**To:** joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** FW: Letter in Support of HR 869  
**Attachments:** ltr in Support HR 869.docx

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Friday, May 06, 2011 2:50 PM  
**To:** 'Karen Clark'  
**Cc:** 'Larrabee, Jason'; 'Hanretty, Ryan'  
**Subject:** Letter in Support of HR 869

Karen,  
Please put the attached letter in final form, attach my signature, and forward a pdf to Jason Larrabee and Ryan Hanretty. Mail the original and copies to the listed ccs.  
Tom

May 6, 2011

The Honorable Jeff Denham  
U.S. House of Representatives  
Washington, D.C. 20515

RE: H.R. 869

Dear Mr. Denham:

I am writing on behalf of Westlands Water District to express its strong support for H.R. 869, legislation that would enable the temporary storage of up to 70,000 acre-feet of additional water in Lake McClure during wet years.

The project authorized by H.R. 869 would result in the modification of an existing spillway at New Exchequer Dam so that excess water could be captured when it is available during wet years and stored for a very brief period, up to eight weeks. The additional water supply would be available for groundwater storage, irrigation and other beneficial uses in the San Joaquin Valley. The project also would generate an additional 10,000 megawatt-hours of clean hydroelectricity, enough to serve 1,700 homes.

Merced Irrigation District, which operates New Exchequer Dam, would pay the entire cost of this project, and no federal funding is required. H.R. 869 would merely authorize the Federal Energy Regulatory Commission to consider the proposed spillway modification during renewal of New Exchequer Dam's federal hydroelectric license.

As you and the co-sponsors of H.R. 869 have repeatedly pointed out, the San Joaquin Valley is critically short of water for farms and communities. The Valley's economic future depends upon finding a variety of practical, affordable water-supply solutions, and the project authorized by H.R. 869 is precisely the type of project that we must pursue if we are going to sustain the economy of this region.

We look forward to the enactment of H.R. 869.

Very truly yours,

Thomas W. Birmingham  
General Manager

cc: The Honorable Devin Nunes  
The Honorable Dennis Cardoza  
The Honorable Jim Costa

**From:** Karen Clark

**Sent:** Thursday, May 19, 2011 8:33 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conf. Call Reminder

All,

We will have a PR/Legislation conference call tomorrow, Friday, May 20 at 7:30 a.m. PST.

If you have any questions, please feel free to contact me.

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

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*(o) 559.241.6234*

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**From:** Jason Peltier

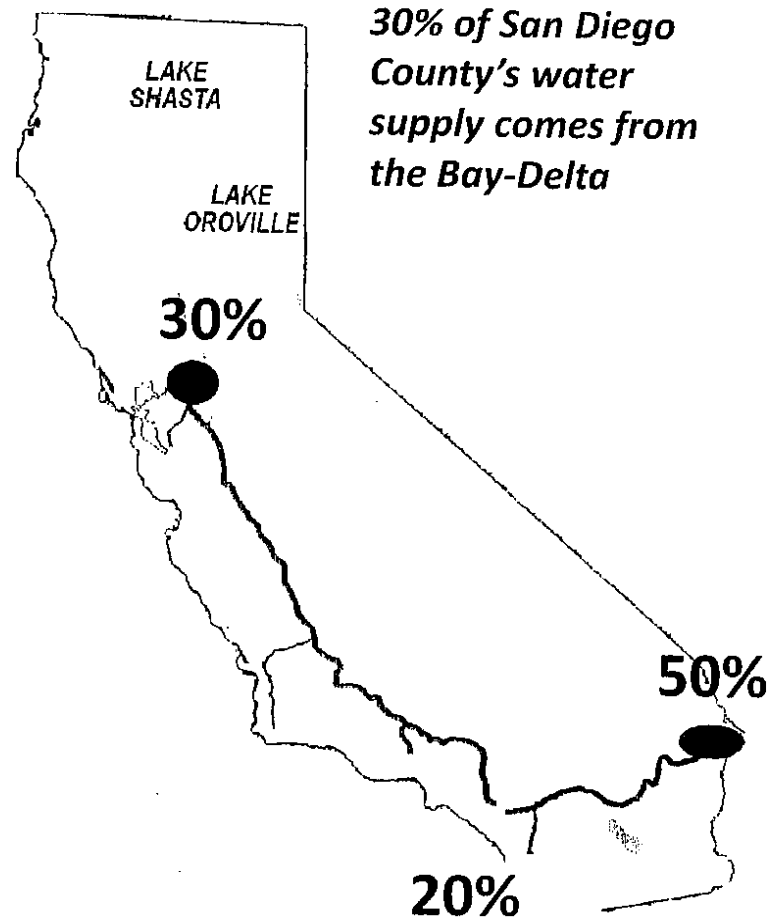
**Sent:** Friday, May 20, 2011 8:14 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Bill Kahrl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'

**Subject:** San Diego PowerPoint

**Attachments:** San Diego PowerPointPresentationMay2011.pdf

# San Diego County Water Authority Supports a Bay-Delta Fix



# Key Bay-Delta Issues of Concern

- ▶ Who's at the table?
- ▶ Southern California issues not addressed
  - Realistic assessment of demand
  - Realistic assessment of willingness and commitment to pay for current or future State Water Project costs
- ▶ Cost
- ▶ What's the timeline – and consequences of further delay

# Who's at the table?

- ▶ Financial “real parties in interest” are not at the table
  - MWD is dependent on water sales revenues from its member agencies
    - But those revenues cannot be counted on
  - MWD's only revenues are provided to it by its member agencies
    - Those revenues are in sharp decline
- ▶ Need firm financing plan and commitments to pay from real parties in interest
- ▶ Delta parties are not at the table
  - Success in the Delta without support of the Delta Community is difficult to envision



# Southern California-

Need realistic assessment of demand

- ▶ MWD's Integrated Resources Plan (IRP) proposes to overdevelop supplies by 500,000 acre-feet
  - New supplies come at the highest cost
  - Inconsistent with statewide conservation mandate
  - Inconsistent with MWD's member agencies' plans to develop independent supplies
    - Urban Water Management Plans due in June
    - MWD finalized its IRP without essential information
- ▶ MWD has become a house of cards
  - Pattern and practice of inflating sales and projected revenues





# Southern California-

Need realistic assessment of willingness to pay

- ▶ MWD member agencies unwilling to commit to pay for current fixed costs
  - Problem was identified more than 15 years ago by independent MWD Blue Ribbon Task Force Report
  - MWD board has failed to act
- ▶ MWD currently proposing to sell water at a discount due to member agency budget constraints
  - But these budgets will become more, not less constrained in the future
- ▶ MWD member agencies want MWD to pay for their own projects, but do not want to pay for MWD projects
  - Member agency managers' letter to Blue Ribbon Committee underscores this point



# Cost

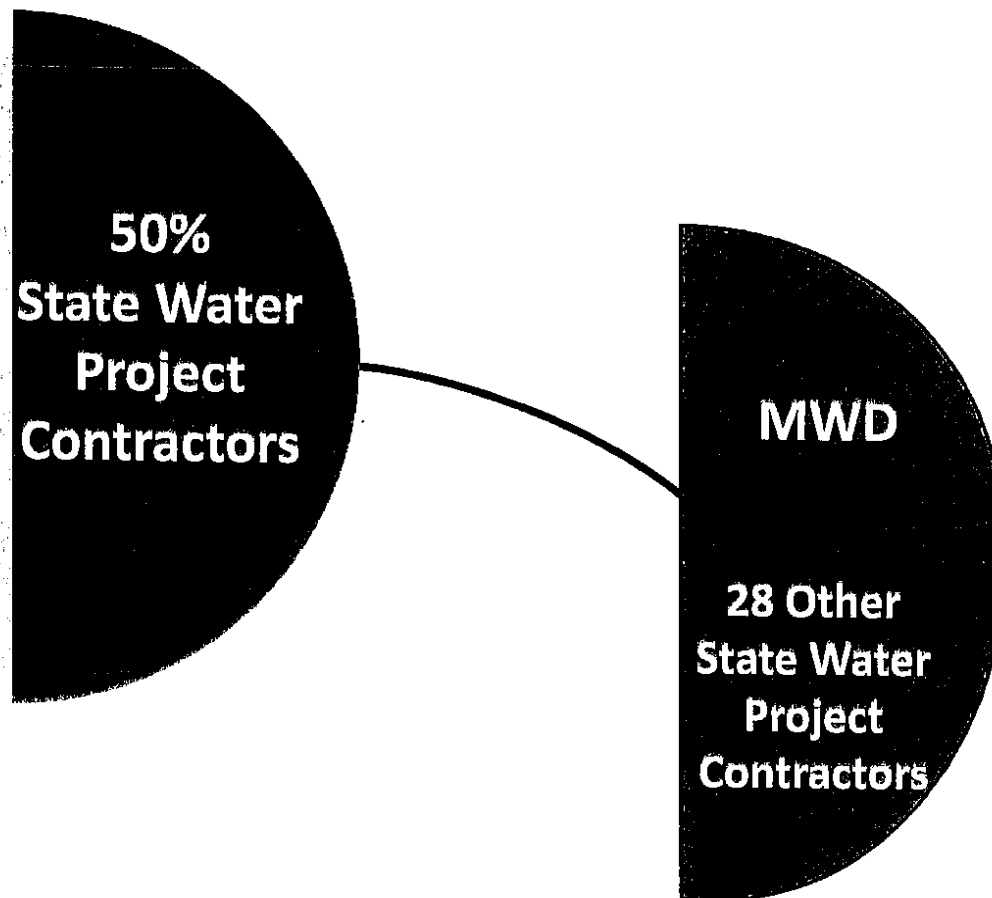
- ▶ Need to connect willingness to spend with willingness and commitment to pay
  - Represented by real, enforceable contracts
  - So far, San Diego is the only member agency willing to do that
- ▶ MWD rate structure has fatal flaw in the assumptions about who will pay for a Delta Fix
- ▶ San Diego is placed at unreasonable risk under MWD rate structure
  - Water Authority payments to MWD amount to 25% of total revenue
  - Water Authority remains largest purchaser of MWD water

# What's the timeline?

- ▶ Failure to grapple with the key issues today will further delay project implementation
  - Failure to talk about cost during the planning process will lead to another “CalFed”
- ▶ Practical implementation challenges presented by absence of Delta community support
- ▶ Southern California water demands won't be “on hold” as the disputes continue
- ▶ Conservation and local projects are being implemented now



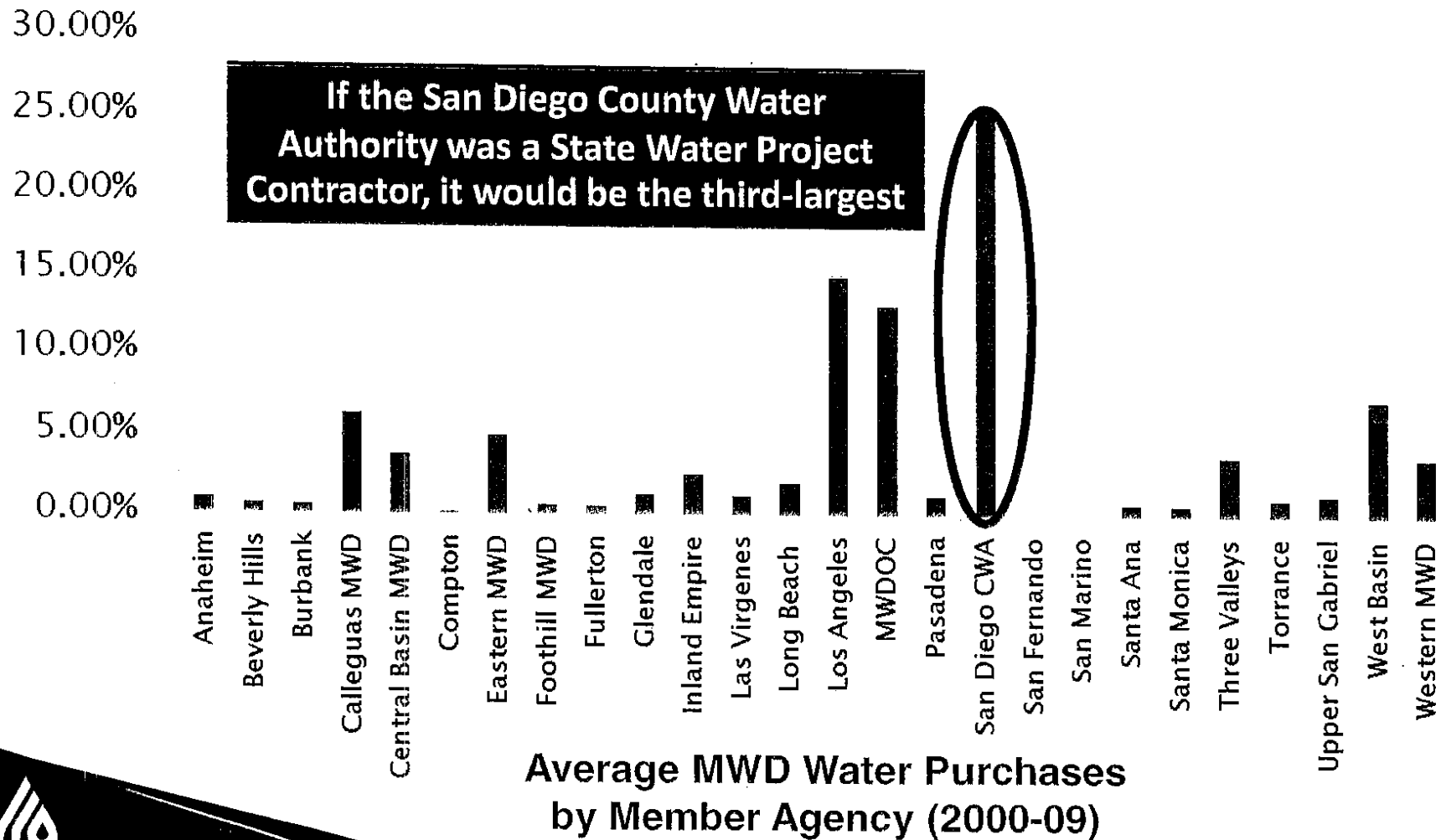
# Who MWD Says Will Pay for the Delta Fix



# Who actually pays MWD's costs?

*Most MWD Member Agencies buy little water*

*With no contracts in place, MWD revenues depend on variable sales*



# The City of San Diego has the Biggest Stake in the Water Authority

Water Authority  
Member Agencies,  
by Size of Total  
Financial Payments



- |                         |                     |                     |                        |                     |                     |
|-------------------------|---------------------|---------------------|------------------------|---------------------|---------------------|
| ■ Carlsbad M.W.D.       | ■ City of Del Mar   | ■ City of Escondido | ■ Fallbrook P.U.D.     | ■ Helix W.D.        | ■ Lakeside W.D.     |
| ■ City of National City | ■ City of Oceanside | ■ Olivenhain M.W.D. | ■ Otay W.D.            | ■ Padre Dam M.W.D.  | ■ Camp Pendleton    |
| ■ City of Poway         | ■ Rainbow M.W.D.    | ■ Ramona M. W.D.    | ■ Rincon Del Diabie    | ■ City of San Diego | ■ San Dieguito W.D. |
| ■ Santa Fe I.D.         | ■ South Bay I.D.    | ■ Vallecitos W.D.   | ■ Valley Center M.W.D. | ■ Vista I.D.        | ■ Yuima M.W.D.      |

# At MWD, there is a disconnect between decisions to spend and willingness to pay

- ▶ Decisions by board members to spend money are disconnected from their agencies' willingness to pay

In 1928, voting, water rights and financial commitment matched

Today, there is no connection

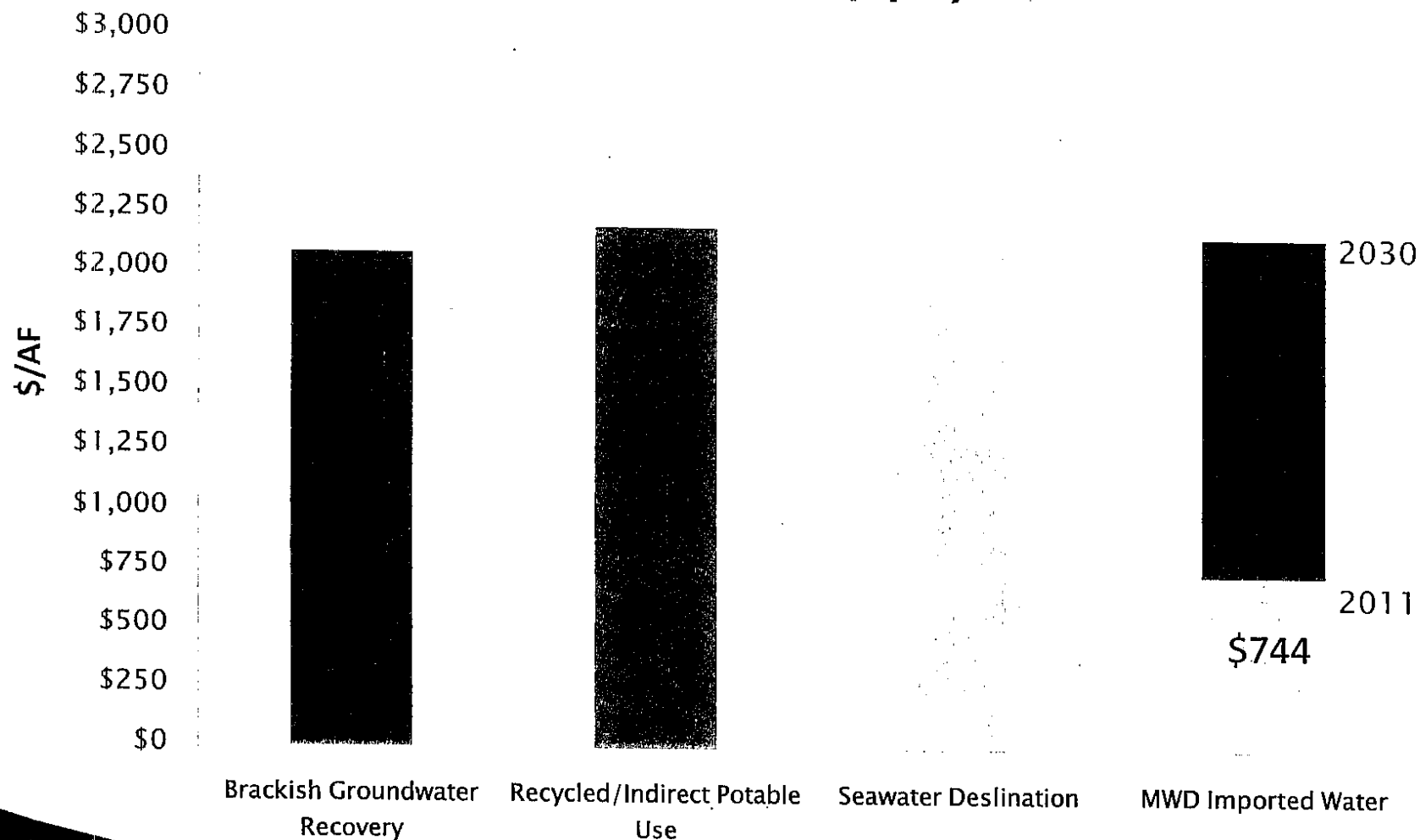
- ▶ Agencies most willing to support new projects have most aggressive plans to reduce purchases from MWD
- ▶ MWD board members support a Delta Fix – but are their agencies willing to pay?

Voting structure based upon arcane 1920's formula

- 1928: 100% of revenues from property taxes
- 2011: 5% of revenues from property taxes



# MWD Member Agencies have Local Supply Options Available that Compare Favorably to Future MWD Supply Costs



MWD Imported Water Cost Assumes \$15 billion Delta Fix and 6%/year escalation



# MWD Member Agency- City of Santa Monica

- ▶ “Today, the plant produces approximately 70 percent of the water residents use.”
- ▶ “...be 100 percent self-sufficient by 2020....”

## Santa Monica Declares Water Self Dependence

posted Feb. 25, 2021, 7:18:00 am

City Dedicates New Water Treatment Plant

San Juan Capistrano  
Santa Monica  
In 1998, the City of Santa Monica has been in process to get out of the Metropolitan Water District of Southern California and become a self-sufficient water utility. The city has been working on this for many years and has now achieved its goal. The city has been able to secure a long-term water supply from the Santa Monica Water Treatment Plant (SMWTP) and the city will only use imported water until it is self-sufficient.

The new plant is operating on a 24-hour basis and the city has been able to secure a long-term water supply from the Santa Monica Water Treatment Plant (SMWTP) and the city will only use imported water until it is self-sufficient.

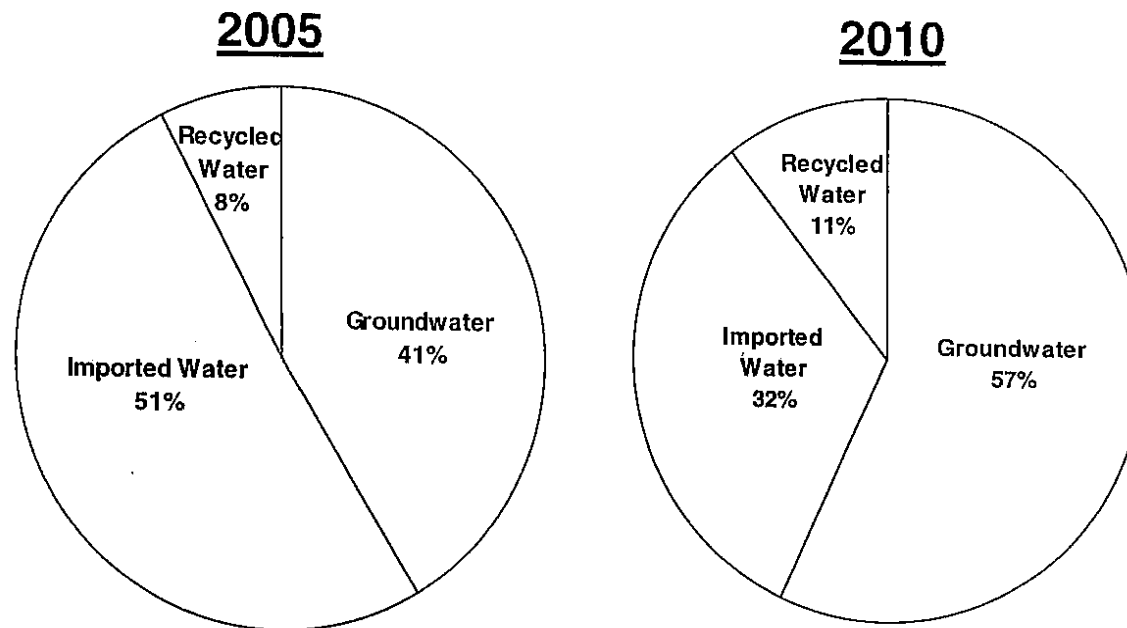
The city has been able to secure a long-term water supply from the Santa Monica Water Treatment Plant (SMWTP) and the city will only use imported water until it is self-sufficient.



San Diego County  
Water Authority

# MWD Member Agency- City of Long Beach

- ▶ Long Beach is reducing its reliance on imported water supplies from MWD



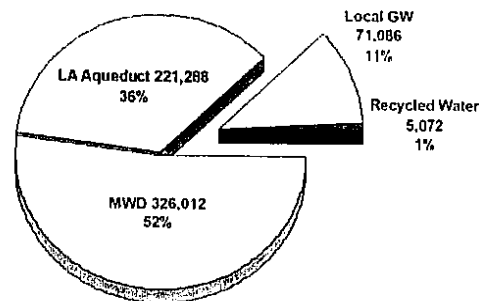
# MWD Member Agency- City of Los Angeles

- Los Angeles plans to reduce its purchases from MWD by 48%

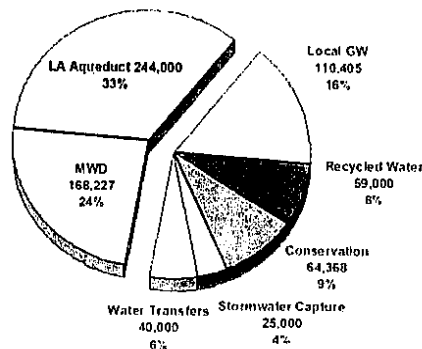


## Comparison of Existing and 2035 Projected Water Supply Sources

FYE 2006 – 2010 Average  
Total: 621,700 AFY



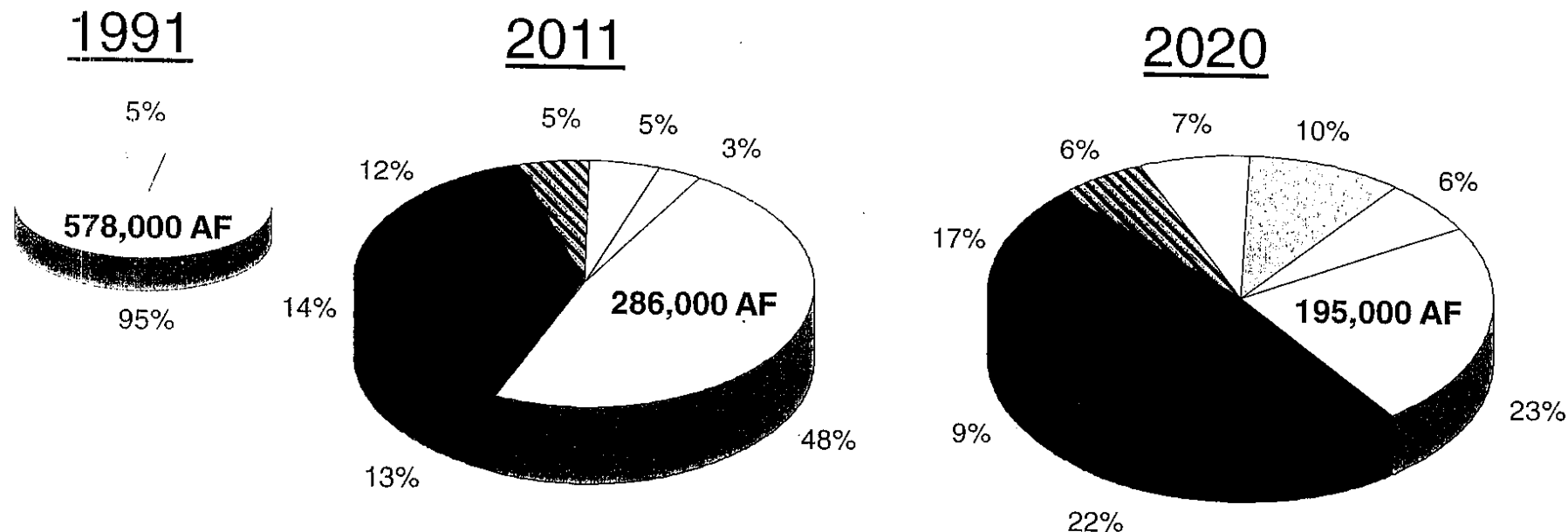
Fiscal Year 2034 – 35  
Total: 711,000 AFY



Note: Charts do not reflect 100,000 AF of existing conservation

16

# The Water Authority is also Increasing Local Supply Development and Reducing its Water Purchases from MWD



## Conservation & Recycling:

1991=0%

2011=44%

2020=54%

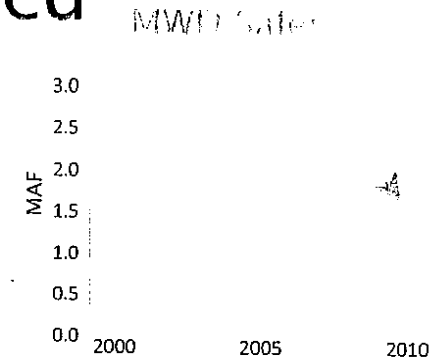
- Imperial Irrigation District Transfer
- All American & Coachella Canal Lining
- Local Conservation
- Recycled Water

- Metropolitan Water District
- Seawater Desalination
- Local Surface Water
- Groundwater

**Supplies from MWD account for about half of San Diego County's supply today, with planned reduction to one-fourth by 2020**

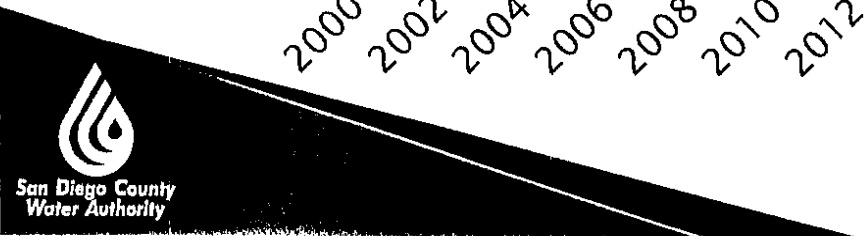
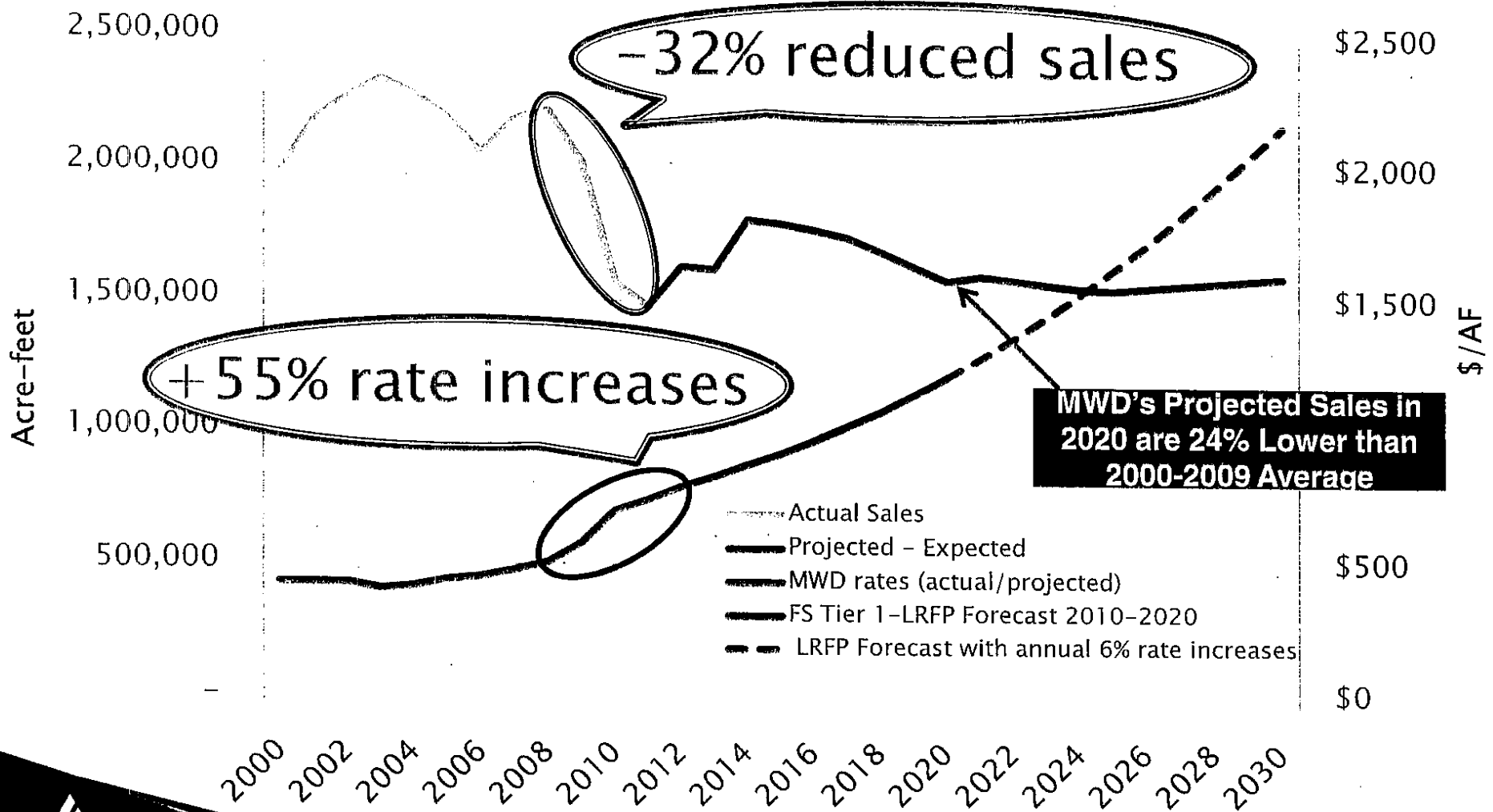
# MWD is experiencing unprecedented financial challenges

- ▶ MWD's rates are rising sharply
  - Up 55% since 2008
- ▶ MWD's water sales are declining sharply
  - Down 32% since 2008
- ▶ Leaving aside one-time budget gimmicks, the current fiscal year shows:
  - Revenue shortfall of almost \$200 million
  - Annual sales at historic low, more than 300,000 acre-feet less than budget adopted by board
    - Lowest water sales in more than two decades
  - Next fiscal year budget also relies on inflated sales projections

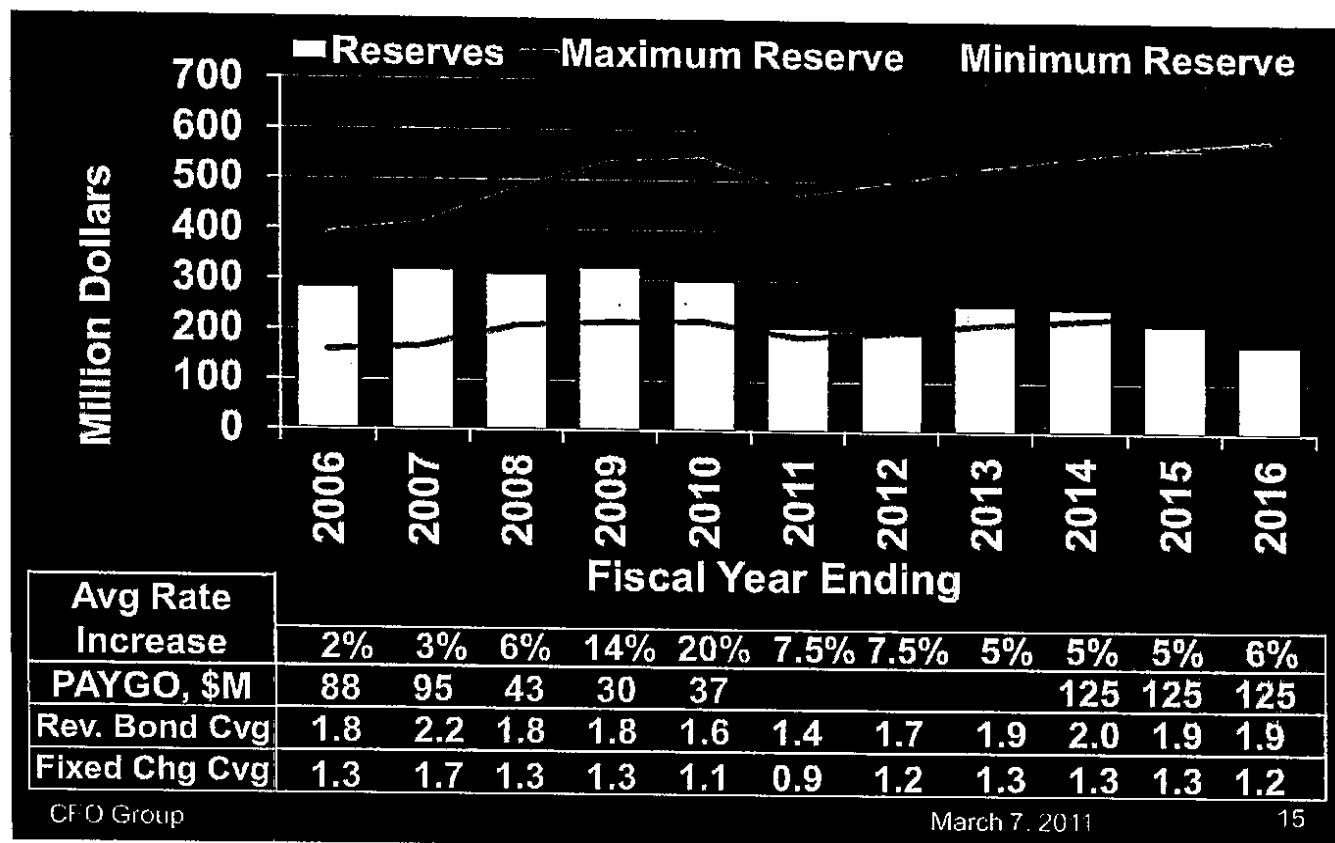


# MWD Sales Decline & Rate Increases

80% of MWD's revenues come from water sales



# MWD's financial reserves are Low – and Shrinking



MWD Slide (3/7/2011)

Assumed sales of 1.8 maf for 2012 thru 2015

# MWD's Failure to Adjust to Changed Circumstances *Will Lead to a Financial Meltdown*

- ▶ In an era of sharply declining sales and member agency reduction in water purchases, MWD:
  - Is continuing to approve new subsidies, which further reduces water sales
  - Is proposing expensive water supply development projects to generate unneeded water
  - Has approved a 2010 Integrated Resources Plan that plans to over-develop 500,000 acre-feet of buffer supplies annually
- ▶ Who will pay?





# MWD's Rate Structure Does Not Cover Current, Let Alone Expanded State Water Project Investment

- ▶ MWD does not have contracts with its 26 member agencies to back up its "Take-or-Pay" State Water Project Supply Contract with the State of California
  - MWD's 2011 obligation to the State: \$573 million
  - Current SWP contract runs through 2035
- ▶ 10-Year MWD "purchase orders" with its member agencies expire in 2012

The Metropolitan Water District of Southern California  
P.O. Box 54153  
Los Angeles, CA 90054-0153  
Attn: Brian G. Thomas, Chief Financial Officer

## Re: Renewal of Purchase Order for Imported Water Supply

Pursuant to the "Renewal" section of the "Purchase Order for Imported Water Supply to be Provided by The Metropolitan Water District of Southern California" effective January 1, 2003 (the "Purchase Order"), we hereby provide non-binding notice to Metropolitan of our intent to renew the Purchase Order, on such terms and conditions as may be mutually agreed by the parties.

# MWD Member Agencies Must Commit to Pay for Current and Future State Water Project Costs

- ▶ But they are unwilling to do so:

*“...to date, most of our board members have said ‘we’re not so sure about that.’ And, most of our member agencies have said ‘No. Thanks, but no thanks, because we prefer this the way it is.’”*

*“Should people make those firm commitments going into the future? So far, the member agencies have opted not to. They prefer it the way it is.”*

-- Excerpts of remarks by MWD General Manager Jeffrey Kightlinger, speaking at an August 10, 2010 public meeting in San Diego on MWD's draft 2010 Integrated Resources Plan (IRP).



San Diego County  
Water Authority



# The Critical Path to a Delta Fix Requires...

- ▶ The right parties to be at the table
- ▶ Realistic assessment of Southern California demands as represented by firm contracts
- ▶ Assurances that water supplies and access to facilities will be provided for by contract
- ▶ This is the essential foundation of a meaningful discussion about willingness to pay for a Delta Fix



# San Diego County Water Authority Pledge to the Bay-Delta

- ▶ The San Diego County Water Authority will:
  - Support a realistic and affordable Bay-Delta fix
  - Back up that support with a firm, long-term contract to pay for its share of water and facilities
  - Will MWD's other 25 member agencies agree to do the same?



**From:** Karen Clark

**Sent:** Thursday, May 26, 2011 8:27 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conference Call

Everyone,

This is a reminder that we will have a PR/Legislation conference call tomorrow (Friday) at 7:30 a.m. PST.

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Thursday, May 26, 2011 2:12 PM  
**To:** kclark@westlandswater.org  
**CC:** TBirmingham@westlandswater.org  
**Subject:** Lunch June 1

Damon will organize lunch at the Capitol Hill Club on Tuesday, June 1.

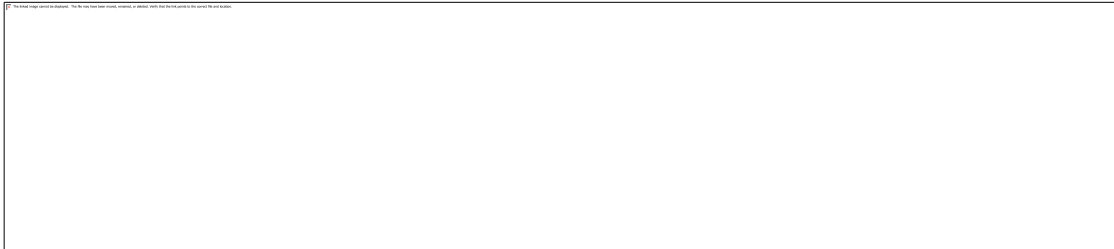
Will shoot for noon.

How many from Westlands? Presume David Bernhardt included?

Thanks. joe

**Joseph T. Findaro**  
Of Counsel  
Akerman Senterfitt LLP | 750 9th Street, N.W. | Suite 750 | Washington, DC 20001  
Dir: 202.824.1702 | Main: 202.393.6222 | Cell: [REDACTED] | Fax: 202.393.5959  
[joseph.findaro@akerman.com](mailto:joseph.findaro@akerman.com)

[V Card](#) | [Bio](#) | [akerman.com](#)



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**From:** Tom Birmingham

**Sent:** Friday, May 27, 2011 6:35 AM

**To:** Tony@onewharf.com; 'Ed Manning'; 'Carolyn Jensen'; joe.findaro@akerman.com; 'Bernhardt, David L.'; 'Doug Subers'; jpeltier@westlandswater.org; 'Gayle Holman'; 'Sheila Greene'; 'Bill Kahr!'; 'Karen Clark'; sramos@westlandswater.org

**Subject:** Conference Call

I apologize for the late notice, but I need to cancel or reschedule this morning's conference call. I would prefer to have the call later today. I will call into the regular number at 11:30 a.m. PDT. Please call in if you're able.

Tom

**From:** Karen Clark

**Sent:** Thursday, June 2, 2011 9:30 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**CC:** Carmela McHenry

**Subject:** Friday, June 3, 7:30 a.m. PR/Legislation Conference Call

All,

This is a reminder that we will have a PR/Legislation conference call tomorrow morning at 7:30 a.m. PST.

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*



**From:** Bill Kahrl  
**Sent:** Thursday, June 2, 2011 5:54 PM  
**To:** Karen Clark  
**Subject:** Re: Friday, June 3, 7:30 a.m. PR/Legislation Conference Call

I will miss the call on Friday morning. I have to fly to New York for closing escrow on my wife's mother's house.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**To:** Tony Coelho [mailto:tony@onewharf.com], Bill Kahrl [mailto:bkahrl@westlandswater.org], Carmela McHenry [mailto:cmchenry@ka-pow.com], Carolyn Jensen [mailto:cjensen@ka-pow.com], David Bernhardt [mailto:dbernhardt@bhfs.com], Doug Subers [mailto:dsubers@ka-pow.com], Ed Manning [mailto:emanning@ka-pow.com], Gayle Holman [mailto:gholman@westlandswater.org], Jason Peltier [mailto:jpeltier@westlandswater.org], Joe Findaro [mailto:joe.findaro@akerman.com], Sheila Greene [mailto:sgreene@westlandswater.org], Susan Ramos [mailto:sramos@westlandswater.org]  
**Cc:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
**Sent:** Thu, 02 Jun 2011 09:30:10 -0700  
**Subject:** Friday, June 3, 7:30 a.m. PR/Legislation Conference Call

All,

This is a reminder that we will have a PR/Legislation conference call tomorrow morning at 7:30 a.m. PST.

Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Tom Birmingham  
**Sent:** Friday, June 3, 2011 5:35 AM  
**To:** 'Bernhardt, David L.'  
**Subject:** This Moning

David,

I am going to work in my room this morning. Thank you for all of your help this week.

Tom

**From:** Bernhardt, David L.  
**Sent:** Friday, June 3, 2011 6:12 AM  
**To:** Tom Birmingham  
**Subject:** Re: This Moning

Thanks Tom have a great trip home.

David Bernhardt  
202-872-5286  
202-████-████ (cell)

On Jun 3, 2011, at 8:34 AM, "Tom Birmingham" <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)> wrote:

David,

I am going to work in my room this morning. Thank you for all of your help this week.

Tom

**From:** Jason Peltier

**Sent:** Friday, June 3, 2011 8:02 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Bill Kahrl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'

**CC:** 'Carmela McHenry'

**Subject:** note Feinstein comments focus on SJRiver

## California water pact attacked by GOP congressmen

[Carolyn Lochhead, Chronicle Washington Bureau](#)

Friday, June 3, 2011

**(06-03) 04:00 PDT Washington** -- House Republicans representing the San Joaquin Valley pressed their attack on California's plan to restore water to fisheries and wildlife, holding a hearing Thursday on a bill that would gut a key bipartisan pact passed by the state Legislature in 2009 after decades of litigation.

The bill has environmental groups and Bay Area Democrats in an uproar, but it has an excellent chance of passing the GOP-controlled House this year - one of many areas from abortion limits to spending cuts where Republicans are moving aggressively to shift the direction of government.

In the Democratic-controlled Senate, however, the water bill faces strong opposition from California Sens. Dianne Feinstein and [Barbara Boxer](#), both Democrats, as well as opposition from the [Obama](#) administration.

"I strongly oppose this bill, which I believe is dramatic overkill," Feinstein said.

The question is whether any parts of the wide-ranging legislation would survive and begin to unravel the state's efforts to allocate scarce water to the competing demands of agriculture and the environment.

The hearing by the House subcommittee on Water and Power sought to bolster legislation by Rep. Devin Nunes, R-Alpaugh (Tulare County), and co-sponsored by Rep. Kevin McCarthy, R-Bakersfield, designed to divert more water to San Joaquin Valley farmers to rectify what the sponsors contend is a "man-made drought" that they say has devastated farmers, idled 250,000 acres of cropland and wreaked havoc on the economy.

The bill would kill a court-approved settlement to restore water to the San Joaquin River and undermine a multimillion-dollar water project to restore the Bay Delta and Northern California fisheries.

Committee Chairman Tom McClintock, R-Elk Grove (Sacramento County), said that despite a heavy snowpack this year that is running at 165 percent of normal, the state's farmers are getting only 75 percent of their contracted water.

The San Joaquin Valley is "ground zero" for the "deliberate creation of water shortages by governmental fiat and the abandonment of the government's responsibility to develop our water resources for the prosperity of our nation," McClintock said.

"Are you guys kidding?" asked Rep. John Garamendi, D-Walnut Grove (Sacramento County). "This is really, really terrible policy. If we want to start another water war, this will do it, guaranteed."

Cynthia Koehler, California water director for the Environmental Defense Fund, said the legislation threatens thousands of coastal fishing jobs and would undo hard-fought compromises that have put farmers and the environment on equal footing on water use.

Nine conservation groups, including the Sierra Club, Nature Conservancy, American Rivers and Defenders of Wildlife, wrote a letter to the committee objecting to the bill.

The wide-ranging legislation would overturn parts of the 1992 Central Valley Project Improvement Act, supersede the Endangered Species Act and state law, and repeal the 2009 San Joaquin River Restoration Settlement Act passed with bipartisan support after 18 years of litigation.

It also would put new controls on spending for the Central Valley Project Restoration Fund, which Republicans said has cost \$800 million so far with "no measurable effect" on improving the environment.

California Secretary for Natural Resources John Laird said in blistering testimony that the legislation would overturn carefully crafted compromises in the state and ignore a century of precedent that prevents Congress from meddling in state water issues.

The bill, Laird added, also would roll back thinking on water allocation to the mid-1990s, before fish populations "crashed" and before it became widely understood that current allocations of water in the Sacramento-San Joaquin River Delta are unsustainable.

By repealing the 2009 pact, Laird said the legislation would "almost certainly send that controversy back to court," setting back, probably by years, efforts to resolve the state's water issues.

State Senate President Pro Tem Darrell Steinberg, D-Sacramento, and Assembly Speaker John Pérez, D-Los Angeles, co-signed a letter opposing the bill, while Michael Connor, commissioner of the federal Bureau of Reclamation, said the legislation failed to "advance the spirit of cooperation and consensus that is essential to making progress on California water issues."

## Bill to stop river project draws powerful foes

*Posted at 10:12 PM on Thursday, Jun. 02, 2011*

By Michael Doyle / Bee Washington Bureau

WASHINGTON – California officials and the Obama administration on Thursday strongly objected to a politically divisive bill that blocks San Joaquin River restoration efforts, casting the bill's long-term prospects into doubt.

Citing "very serious problems" with the bill authored by Rep. Devin Nunes, R-Visalia, administration officials warned against breaking apart the river restoration settlement that in 2006 ended an 18-year-long lawsuit pitting farmers against environmentalists.

"The bill would not only undo the very valuable restoration work committed to by all the settling parties, but would also ... pave the way for many more years of costly court battles," Interior Secretary Ken Salazar warned a House panel.

California Natural Resources Secretary John Laird echoed that warning, saying the bill would "almost certainly send the controversy back to court, where the consequences of litigation would be unknown."

As a statement, though, the San Joaquin Valley Water Reliability Act could succeed even if it dies in the Senate. Critics fear it might also propel over the finish line other California water provisions.

-  [Archive on San Joaquin River restoration](#)

Republicans specifically cast the legislation in partisan terms, repeatedly contrasting the GOP's farmer-friendly efforts with what Nunes described as "four years of neglect by the [previous] Democratic majority." The bill allows lawmakers to articulate a position, with various Republicans Thursday denouncing "uncompromising environmental groups" and "left-wing ideology."

"California's San Joaquin Valley is ground zero for what's gone wrong with federal water policy," declared Rep. Tom McClintock, R-Elk Grove, the chairman of the House water and power subcommittee.

Though the hearing was the first on Capitol Hill to consider the water legislation, lawmakers and witnesses spent at least as much time revisiting old feuds as on discussing the bill's details. At one point, Westlands Water District general manager Tom Birmingham and Rep. John Garamendi, R-Walnut Grove, clashed over water negotiations they had back in 1997.

This year's 38-page bill would stop the ambitious program that currently aims to return salmon to the San Joaquin River by Dec. 31, 2012. The bill also would lengthen irrigation contracts, curtail environmental protections in the Sacramento-San Joaquin Delta and provide farmers more water. "The pumps have to run," Nunes said, and "the San Joaquin River boondoggle has to end."

Working on a separate front, Nunes and his allies succeeded Thursday in stripping \$66 million in San Joaquin River restoration funds from a fiscal 2012 spending bill.

The Friant Water Users Authority and the Natural Resources Defense Council signed the river settlement in 2006. Without the agreement, negotiators reckoned that a federal judge would control the water decisions.

Barry Nelson of the Natural Resources Defense Council and Cynthia Koehler of the Environmental Defense Fund both cautioned Thursday that cracking the river settlement could undermine confidence in other water negotiations, particularly those underway through the Bay Delta Conservation Plan.

Neither Friant nor the NRDC were invited to testify Thursday. Instead, the subcommittee summoned farmer Kole Upton, a former Friant chairman who now opposes the river restoration plan. "The salmon restoration is behind schedule and the question should be asked whether this effort warrants the expenditure of so much public money," Upton said.

Bureau of Reclamation Commissioner Michael Connor acknowledged the Dec. 31, 2012, deadline for returning salmon to the river may slip, suggesting that "we are interested in looking at the schedule" for possible revisions.

The water bill is almost certain to pass the Republican-controlled House, possibly this summer.

Rep. Jim Costa, D-Fresno, said Thursday he will support the bill so that further negotiations can ensue.

Neither of California's two Democratic senators, Dianne Feinstein and Barbara Boxer, support the current bill. This complicates the bill's final passage, though Nunes says he's working with senators from other states.

Read more: <http://www.fresnobee.com/2011/06/02/2412695/bill-ending-river-project-draws.html#ixzz1OE1kuEe9>

## S.J. River plan in peril

*South Valley congressman wants more Delta water*

 [Print this Article](#)  [Email this Article](#)

Text Size: [A](#) | [A](#) | [A](#)

By **Alex Breitler**  
Record Staff Writer  
June 03, 2011 12:00 AM

A south Valley congressman's latest effort to wring more water from the Delta would block a plan to restore the San Joaquin River and could upend a new state policy treating the environment and water supply as coequal values.

Rep. Devin Nunes, R-Visalia, told a House subcommittee Thursday that the federal government has broken a promise made in 1994 that it would not withhold any additional water from farms south of the Delta.

Legislation written by Nunes proposes sweeping changes to crank up the export pumps near Tracy.

### Highlights

Here's what Rep. Devin Nunes' bill HR1837, the San Joaquin Valley Water Reliability Act, would do:

- Repeal the restoration plan for the San Joaquin River.
- Remove non-native striped bass from the list of Delta species to be protected under the federal Central Valley Project Improvement Act.
- Cap the amount of water that can be dedicated to fish and wildlife under that federal law.

- Direct the federal government not to distinguish between wild fish and hatchery-produced fish, despite behavioral differences.
- Revive the 1994 Bay-Delta Accord, a truce in the water wars that established how much water could be exported from the Delta. Under the Nunes plan, if the state and federal water projects abide by the terms of the accord, they'll be in compliance with the Endangered Species Act. Critics say this would shift the burden of saving species to non-project water users such as Delta farmers, upset the state's coequal goals of a reliable water supply and healthy ecosystem, and impede California's right to manage its own water.

"Everyone that has the real interest at heart of securing water reliability to the region between Modesto and Bakersfield knows the pumps have to run," Nunes said. "(Federal law) needs to be reformed, and the San Joaquin River boondoggle needs to be replaced."

But his legislation faces vigorous opposition from environmental groups, Delta farmers, the federal government and the state of California, which argues that the bill would trample over state law and upset more recent efforts to solve the Delta's problems.

Essentially, Nunes' bill shifts the burden of saving endangered species from the state and federal water projects to those who take water from upstream tributaries or from the Delta itself, said Tom Zuckerman, an attorney whose family farms the Delta. Landowners within the watersheds could be forced to give up water for south Valley landowners who rely on exported water.

"This legislation would turn 110 years of state rights on its ear," Zuckerman said this week.

Things have changed since the 1994 Bay-Delta Accord, a truce of sorts that established on a temporary basis how much water could be taken from the Delta. For one, several species of native fish have collapsed toward extinction. California water officials have determined much larger freshwater flows through the Delta are needed to save them.

Nunes has attempted to increase exports from the Delta multiple times in recent years, arguing that efforts to save the 3-inch Delta smelt caused a huge spike in unemployment.

It's unclear how far this latest legislation will go. Opponents fear that even if the bill itself fails, bits and pieces could be used as negotiating tools during budget talks and perhaps be attached to other bills.

Thursday's subcommittee hearing - the first for Nunes' bill - featured many of the same arguments that have been made for decades, with the term "water wars" lobbed around the room like rhetorical hand grenades.

"There is no war," Nunes said. "There is only surrender on behalf of San Joaquin Valley residents. The farmers surrendered in 1992, the farmers surrendered in 1994, the farmers surrendered with the San Joaquin River settlement.

"Really, you only have a war from one side. And that's from the radical environmental groups that are massacring the people that live in our communities. Complete annihilation, where we have pockets of unemployment that at some point reach 50 percent in some communities."

Despite Nunes' fiery language, the University of the Pacific's Business Forecasting Center determined in 2009 that most of the Valley's high unemployment could be blamed on the collapse of the construction industry, not a lack of water.



As for expensive plans to restore the San Joaquin, a federal Bureau of Reclamation official Thursday admitted that delay may be necessary.

But eliminating the program outright, Commissioner Michael Connor said, would probably mean more lawsuits on top of the 18 years of litigation already in the books.

Contact reporter Alex Breitler at (209) 546-8295 o

**From:** Jason Peltier  
**Sent:** Wednesday, June 8, 2011 2:53 PM  
**To:** joe.findaro@akerman.com; 'David Bernhardt'  
**Subject:** AS

---

-----Original Message-----

From: FN-White House Office of Legislative Affairs  
Subject: Notification: Nominee for Assistant Secretary for Fish and Wildlife  
Sent: Jun 8, 2011 4:26 PM

The President plans to announce his intent to nominate the following person to a key post in the Administration.  
This information is embargoed until the White House Press Office releases.

Rebecca Wodder  
Assistant Secretary for Fish and Wildlife, Department of the Interior

Rebecca Wodder has served as President and CEO of American Rivers, a national river conservation organization, since 1995. From 1981 to 1994, Ms. Wodder served in several different capacities at The Wilderness Society, including Vice President for Organizational Development and Vice President for Membership, Marketing and Development. From 1978-1980, Ms. Wodder was Legislative Assistant to U.S. Senator Gaylord Nelson on environmental and energy issues. Ms. Wodder began her career as an Environmental Planner for the Leo A. Daly Company, Architects, Engineers and Planners. In 2010, she was recognized as a Top 25 Outstanding Conservationist by Outdoor Life Magazine, and was named Woman of the Year by the American Sportfishing Association in 1998. Ms. Wodder holds a B.A. in Biology and a B.A. in Environmental Studies from the University of Kansas. She also holds an M.S. in Landscape Architecture and an M.S. in Water Resources Management from the University of Wisconsin-Madison.

**From:** Fiona Hutton

**Sent:** Friday, June 10, 2011 4:44 PM

**To:** Ann Newton; Bill Kahrl; Bob Muir; Boni Brewer; Brent Walthall; Byron Buck; Deborah Kollars; Frances Brewster; Greg Zlotnick; Jason Peltier; Jennifer Persike; Kathy Cole; Kurt Arends; Laura King Moon; Linda Waade; Mary Ann Ruiz; Mary Lou Cotton; Mike Wade; Mitch Zak; Ron Davis; Sarah Woolf; Teresa Alvarado; Terry Erlewine; Tim Hunt; Tom Philp; 'Walt Wadlow'

**Subject:** MWD Comment Letter on Third Draft of Delta Plan

**Attachments:** Scan001.PDF; MWD Revisions 3rd draft Delta Plan\_Chap 3and4\_061011.pdf; MWD Revisions 3rd draft Delta Plan\_Chapter 5\_061011.pdf; MWD Revisions 3rd draft Delta Plan\_Chapter 7\_061011.pdf

FYI...see below from Kathy Cole.

Fiona J. Hutton

President

Fiona Hutton & Associates, Inc.

12711 Ventura Blvd., Suite 280

Studio City, CA 91604

T: 818.760.2121

F: 818.760.2202

C: 818.259.7091

Email: fhutton@fionahuttonassoc.com

Skype: fiona huttonassoc

www.fionahuttonassoc.com

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-----Original Message-----

From: Cole, Kathy

Sent: Friday, June 10, 2011 2:55 PM

To: 'phil.isenberg@deltacouncil.ca.gov';

'randall.fiorini@deltacouncil.ca.gov'; 'gloria.gray@deltacouncil.ca.gov';

'patrick.johnston@deltacouncil.ca.gov';

'henry.nordhoff@deltacouncil.ca.gov'; 'don.nottoli@deltacouncil.ca.gov';

'felicia.marcus@deltacouncil.ca.gov'; 'joe.grindstaff@deltacouncil.ca.gov';

'Keithc@DeltaCouncil.ca.gov'; 'martha.davis@deltacouncil.ca.gov';

'jessica.pearson@deltacouncil.ca.gov'

Cc: 'Martin, Elaine@DeltaCouncil'

Subject: MWD Comment Letter on Third Draft of Delta Plan

Members of the Delta Stewardship Council, Executive Officer Grindstaff and DSC Council staff:

Attached is a letter signed by Jeffrey Kightlinger, General Manager of The Metropolitan Water District of Southern California, and accompanying

revisions to the third staff draft of the Delta Plan.

Metropolitan has also participated in the coalition of statewide urban and agricultural interests that is developing an alternative Delta Plan, and we support the coalition letter submitted to you also on June 10.

The attached comment letter and revisions are intended to be consistent with the coalition approach.

A hard copy of the transmittal letter and suggested revisions have been delivered to your offices.

Thank you for your consideration.

Kathy Cole  
o/b/o Jeffrey Kightlinger, General Manager The Metropolitan Water District  
of Southern California

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THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

*Office of the General Manager*

June 10, 2011

Delta Stewardship Council  
980 Ninth Street, Suite 1500  
Sacramento, CA 95814

**Sent via e-mail to Individual Council Members  
and Council Executive Director**

Dear Chairman Isenberg and Members of the Council:

Specific Revisions to Third Staff Draft Delta Plan

The Metropolitan Water District of Southern California (Metropolitan) previously submitted comments to the Council on the Third Staff Draft Delta Plan (Draft Plan) that addressed several areas of remaining concern we have with the Plan's ability to achieve the co-equal goals of ecosystem restoration for the Delta and water supply reliability for California. Upon further review of the Third Draft Plan, Metropolitan developed suggested revisions that address many of our key concerns. We ask that you please consider the attached revisions to chapters 3, 4, 5 and 7 as you continue your work to complete the Delta Plan.

Metropolitan is also participating in the coalition of statewide urban and agricultural interests that is developing an alternative Delta Plan, and we support the coalition letter submitted to you on June 10. The specific Delta Plan revisions we are proposing are intended to be consistent with the coalition approach for an alternative Delta Plan.

Overall, Metropolitan's proposed revisions to the Third Draft Plan seek to create a plan that draws on the expertise and outcomes of the agencies that have responsibilities in the Delta. The proposed revisions modify the description of the Council's role and authorities in water management, ecosystem restoration and Delta risk reduction to be consistent with existing law, and rephrase some of the policies more appropriately as recommendations to state agencies or the Legislature. Following is a summary highlighting Metropolitan's proposed revisions to the Draft Plan chapters.

- Revisions to Chapter 3 clarify the definition of covered action and the description of the process to certify consistency of covered actions with the Delta Plan.
- Revisions to Chapter 4 clarify the policies and recommendations addressing regional self reliance to emphasize recommendations to the appropriate agencies to develop policies and guidance for a new water sustainability element in the Urban Water Management Plan (or an equivalent plan). Other revisions properly place the discussion of Delta flow

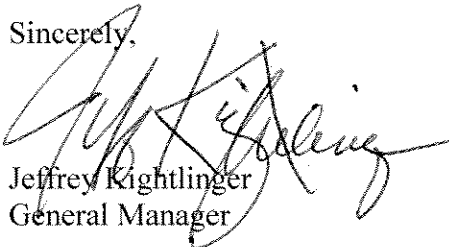
June 10, 2011

criteria as a recommendation to the State Water Resources Control Board and urge the State Water Board to consider the many other factors that impact the Delta.

- Revisions to Chapter 5 clarify the role of the Bay Delta Conservation Plan in achieving the co-equal goals.
- Revisions to Chapter 7 incorporate the essential actions necessary for the Council to meet the overarching and long-term economic or ecosystem sustainability goals required to meet the Council's responsibilities under the Delta Reform Act.

We urge you to consider these revisions to the Delta Plan. We believe these revisions are an essential step to creating a workable Delta Plan that provides an effective role for the Delta Stewardship Council to organize and encourage state and federal agency actions and decisions that are necessary to achieve the co-equal goals.

Sincerely,



Jeffrey Kightlinger  
General Manager

Attachments

cc: Members of the Delta Stewardship Council  
Mr. Joseph Grindstaff

# Chapter 3

## Governance: Implementation of the Delta Plan

### Covered Actions Are a Core Responsibility

Central to the work of the Council is this Delta Plan. In contrast to plan implementation in most governmental contexts, the Council does not exercise direct review and approval authority over proposed actions for consistency with the Delta Plan. In most cases, the Delta Plan functions as a strategic plan in that it is a guidance and recommendation document. However, in some cases, actions taken by local or State agencies are “covered actions” as defined in Water Code section 85057.5. The State or local agency proposing to carry out, approve, or fund a “covered action” certifies the consistency of the covered action with the Delta Plan and files a certificate of consistency with the Council. A certificate of consistency may be appealed to the Council within 30 days, alleging that the proposed covered action is not consistent with the Delta Plan. Upon receiving such an appeal, the Council has 60 days to hear the appeal and an additional 60 days to make its decision and issue specific written findings. These indirect processes and tight time lines are unique among California state agencies. They will work most effectively if based on clear regulations, transparency, and energetic Council management of its agenda.

Only certain activities qualify as covered actions, and the Act establishes both criteria and exclusions. This Delta Plan further clarifies what is and is not a covered action. As an example, routine levee maintenance by a reclamation district in the Delta would not be a covered action because it is statutorily excluded. Also, an addition to a house in an incorporated city would likely not be a covered action because it would not appear to have a significant impact on the Delta. However, a new intake for water supply from the Delta, development of a subdivision in a Delta floodplain that does not meet exclusion criteria in the Act, or establishing a new tidal marsh area are likely to be covered actions.<sup>1</sup> The ultimate determination of whether or not a proposed project is a covered action rests with the proponent, the state or local agency. However, any determination that a proposed project is not a covered action under the Act may be challenged in court. While the Council does not make the decision whether a proposed project is a covered action, the Council is authorized and willing to work with the proponent to provide advice.

This Delta Plan incorporates and builds upon existing state policies where possible, with the intention of meeting the Act’s requirements without establishing an entirely new set of policies. For example, Delta Plan regulatory policies on reducing flood risk incorporate recent California legislation that requires upgrades to levees protecting urban areas.

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<sup>1</sup> There are specific exemptions for land in the Secondary Zone that are consistent with a sustainable communities strategy or where a notice of determination was filed by September 30, 2009. For a more detailed list see Water Code section 85057.5.

In other cases, Delta Plan regulatory policies seek to prevent actions that may preclude the future implementation of projects that meet the requirements of that Act, such as the acquisition of floodplain area for construction of a new bypass or restoration of certain lands uniquely suited to habitat. Similarly, the Delta Plan includes regulatory policies to protect floodplains and floodways until studies are completed by the Department of Water Resources.

The Act requires the Council to establish and oversee a committee of agencies responsible for implementing the Delta Plan. The statute directs each agency to coordinate its actions pursuant to the Delta Plan with the Council and other relevant agencies. The Council will commence regularly scheduled coordination meetings of the appropriate and interested agencies upon adoption of the Delta Plan. Council staff has met with federal agencies and is developing the Delta Plan in consultation with these agencies in order to pursue future consistency and compliance with the Coastal Zone Management Act, as required by Water Code section 85300(d)(1)(A).

## How Will the Regulatory Policies of the Delta Plan Work in Practice?

This section includes a discussion of the general requirements for certifying consistency with the Act and additional examples of covered actions. Delta Plan policies are not intended and shall not be construed as authorizing the Council or any entity acting pursuant to this section, to exercise their power in a manner which will take or damage private property for public use, without the payment of just compensation. This policy is not intended to affect the rights of any owner of property under the Constitution of the State of California or the United States. None of the Delta policies increase the State's flood liability.

## What Is the Definition of a “Covered Action”? Who Determines Whether a Proposed Plan, Program, or Project Is a “Covered Action”?

A “covered action” is defined in the Act as:

*“...a plan, program, or project as defined pursuant to Section 21065 of the Public Resources Code that meets all of the following conditions:*

- 1. Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;*
- 2. Will be carried out, approved, or funded by the state or a local public agency;*
- 3. Is covered by one or more provisions of the Delta Plan;*
- 4. Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta.” (Water Code section 85057.5(a))*

The first step in determining a “covered action” is to identify whether the proposed plan, program, or project meets the definition in Public Resources Code section 21065. That particular provision is the section of the California Environmental Quality Act that defines the term “project” for purposes of potential review under the California Environmental Quality Act (CEQA). ~~It is important to note, however, that CEQA’s contains various statutory and categorical exemptions—which are considered for possible application in a CEQA analysis only after the threshold determination of a CEQA that exempt an action that otherwise would meet the basic definition of a “project.” is made—are not~~



~~similarly incorporated by cross-reference in the definition of “covered action.”~~ Thus, for example, while ~~one section of a proposed action might meet the basic definition,~~ CEQA provides that its terms do not apply to “ministerial projects” (see Public Resources Code sec. 21080(b)(1)); if a proposed action that in the first analysis would be a project under CEQA and thus a covered action under the Act, fits the “ministerial” exemption, those types of projects do it would not fall under the CEQA or the Act’s definition of “covered action.”

The next step in determining a covered action is to review the four additional conditions in the definition of “covered action,” all of which must be met by a proposed plan, program, or project, even if it meets the CEQA definition of a “project.”

In order to qualify as a covered action, the action must occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh. It must be carried out, approved, or funded by the state or a local public agency.

A proposed plan, program, or project must be covered by one or more provisions of the Delta Plan, ~~meaning that a regulatory policy is applicable to the proposed action.~~ The Delta Plan may exclude specified actions; therefore, those actions would not be covered by one or more provisions of the Delta Plan.

In addition, a proposed plan, program, or project must have a “significant impact on achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta” under Water Code section 85057.5(a)(4). For this purpose, the Council has determined that “significant impact” means a substantial or potentially substantial change in existing conditions that is directly, or indirectly, ~~and/or cumulatively~~ caused by a project and that will ~~or may affect~~ significantly impact the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and State interests in the Delta.

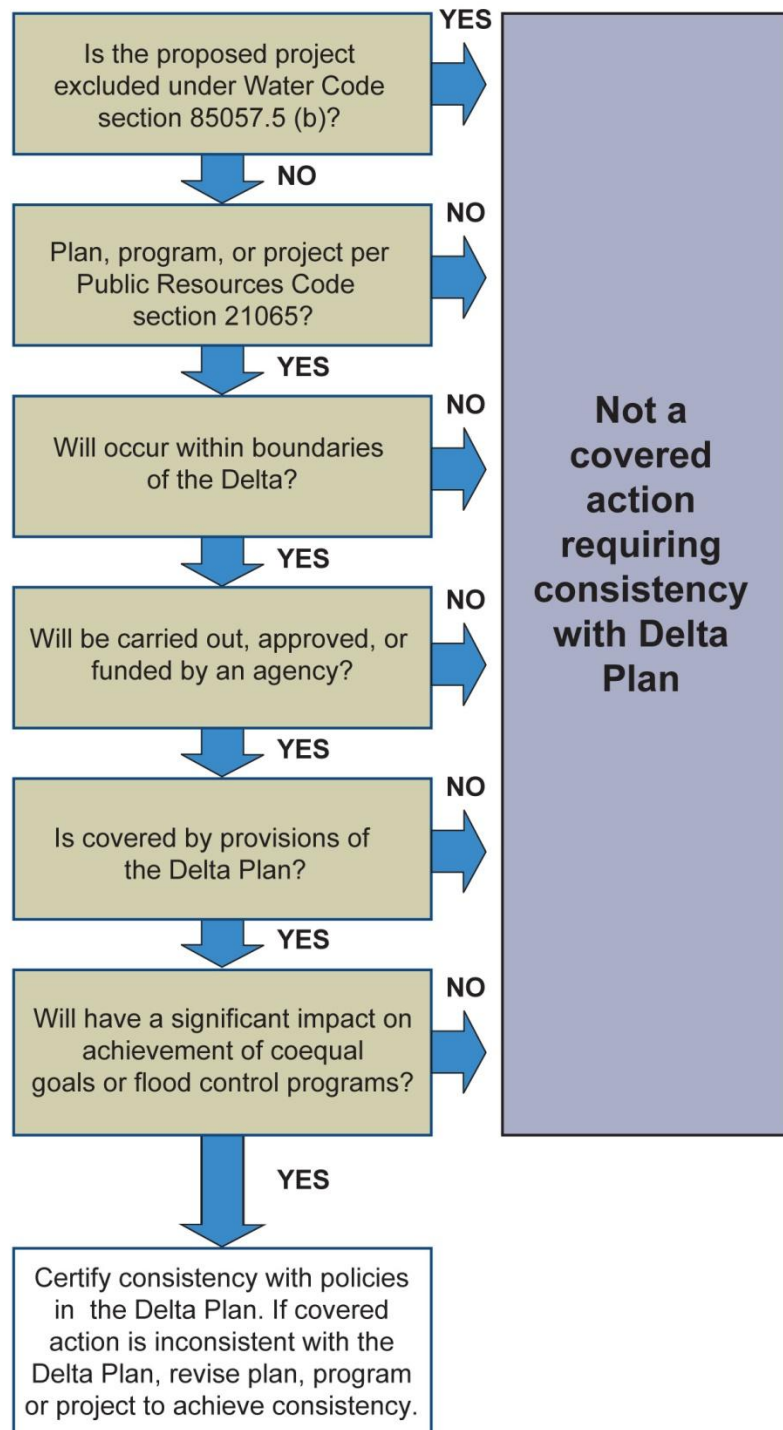
Certain actions are statutorily excluded by the Act from the definition of “covered action,” for example:

- φ a regulatory action of a state agency (such as the adoption of a water quality control plan by the State Water Resources Control Board, or the issuance of a California Endangered Species Act permit by the Department of Fish and Game),
- φ routine maintenance and operation of the State Water Project or the federal Central Valley Project, and
- φ routine maintenance of levees by a reclamation district (Water Code section 85057(b)).

As specified in Paragraph 2 of the Council’s Administrative Procedures Governing Appeals (Appendix A), if requested, the Council’s staff will meet with an agency’s staff during “early consultation” to review the consistency of a proposed action and to make recommendations. The agency’s staff may also seek clarification of whether a proposed project is a “covered action,” provided that the ultimate determination on whether it is a covered action shall be made by the agency, subject to judicial review.

Figure 3.1 shows the steps in identifying a covered action. Agencies retain flexibility in how to meet these responsibilities for covered actions within the parameters of other legal authorities.

**Figure 3.1**  
**Decision Tree for State and Local Agencies on Possible Covered Actions**



WBG01281114346SAC Figure\_3-1.ai

## Certifications of Consistency

State or local agencies that propose to undertake “covered actions” are required to certify with the Council, prior to initiating implementation, that these proposed plans, programs, or projects are consistent with the Delta Plan (Water Code section 85225 et seq.). The Council will develop a check list which agencies may use to facilitate the process. Additionally, as required in statute, an agency that proposes to undertake a covered action must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with the Delta Plan (Water Code section 85225). These findings must be submitted to the Council as part of the certification of consistency. Any person may appeal the certification of consistency and, if a valid appeal is filed, the Council is responsible for subsequent evaluation and determination—as provided in statute and the Council’s Administrative Procedures Governing Appeals—of whether the proposed covered action is consistent with the Delta Plan’s ~~regulatory policies~~. More than one ~~provision regulatory policy~~ in the Delta Plan may apply to a covered action.

If the Council determines on appeal that a covered action is not consistent with the Delta Plan it will remand the proposed action to the state or local public agency. The state or local public agency may decide to proceed with the covered action as proposed, or as modified to respond to the Council’s findings, despite a Council determination that it is not consistent with the Delta Plan. However, prior to proceeding the state or local public agency must file a revised certification that addresses each of the findings made by the Council. (Water Code Section 85225.5) While the state or local public agency may choose to proceed with a covered action even though the Council has determined it is not consistent with the Delta Plan, the determination of the Council will likely be a consideration in obtaining regulatory approvals for the action.

A covered action must not only be consistent with the Delta Plan at time of certification, but to ~~remain be~~ it must also be implemented as described in its finding of consistency.

Certifications for consistency must demonstrate that a covered action is consistent with the Delta Plan by being fully transparent, disclosing potential impacts, demonstrating legal authority and that the action can be implemented as described in its finding of consistency~~sufficient capacity~~, complying with all relevant laws, and identifying how best available science will be used in decision-making and adaptive management.

The Act contains multiple references to the use of best available science, including specific requirements such as, for example, that ongoing ecosystem restoration or water management decisions include a science-based, transparent, and formal adaptive management strategy (Water Code section 85308(f)). Best available science involves not only the use of sound information but is a process that meets the criteria of (1) relevance, (2) inclusiveness, (3) objectivity, (4) transparency and openness, (5) timeliness, and (6) peer review (National Research Council 2004). Best available science is consistent with the scientific process (Sullivan et al. 2006). Best available science is specific to a decision context and would necessarily be related to the specific decision to be made and the time frame available for that decision. For science to be considered “best available” to support a decision, reasonable care must be taken to identify all available and relevant scientific information. Sources for best available science may include peer-reviewed publications, general scientific reports and publications, scientific expert opinion, or even anecdotal evidence. See Chapter 2 for a more detailed discussion of best available science. Table 2-1 establishes the priority for the value placed on each information source.

## Policy

G P1 Certifications for consistency with the Delta Plan must address the following:

All covered actions must be fully transparent by disclosing all potentially significant adverse environmental impacts and mitigations of those adverse impacts.

All covered actions must be based on best available science. **[COUNCIL TO DISCUSS FURTHER]**

All covered actions must ~~describe the demonstrate~~ managerial and financial capacity to implement the covered action over the long term. ~~Managerial capacity includes ownership and water rights relevant to the covered action. Financial capacity includes budgeting, capital improvement planning, and a financing plan relevant to the covered action.~~

All covered actions must identify and comply with existing relevant law, including water quality regulations and water rights.

Large-scale ecosystem restoration and water management covered actions must describe the process that will include adequate provisions to assure provide continued implementation of adaptive management consistent with the Delta Plan.

~~—This requirement shall be satisfied through:~~

- ~~⊕ an adaptive management strategy consistent with the adaptive management framework of Chapter 2;~~
- ~~⊕ documentation of how the proposed covered action will achieve its desired result;~~
- ~~⊕ performance measures and targets relevant to meeting the Delta Plan's objectives enumerated in Section 85302(c), Section 85302(d), and Section 85302(e);~~
- ~~⊕ monitoring and analyses requirements sufficient to make adaptive management decisions and to capture any effects that may help or hinder achieving the coequal goals as expressed in the Act or the Delta Plan;~~
- ~~⊕ documentation of delineated authority by the agency responsible for the covered action to support the implementation of the full adaptive management process, including planning, implementation, monitoring, data management, analyses, obtaining the best available science, communicating results, supporting decision making, and full implementation of any changes in implementation of the covered action; and~~
- ~~⊕ procedures ensuring public release of all information developed related to adaptive management, including, but not limited to, primary data, modeling, analyses, and syntheses of research findings.~~

## Changing the Delta Plan

### Incorporation of Another Plan into the Delta Plan

The Council may incorporate another plan, in whole or in part, into the Delta Plan. When fully incorporated, these elements of another plan become the basis for consistency determinations and relevant to the actions of State and local agencies. The agency which has the original plan authority will continue to take actions under that authority.

## Incorporation of the Bay Delta Conservation Plan into the Delta Plan

The Bay Delta Conservation Plan is a major project considering large-scale improvements in water conveyance and large-scale ecosystem restorations in the Delta. When completed, it must be incorporated into the Delta Plan if it meets ~~specified~~ conditions [specified in the Act](#). Completion of the Bay Delta Conservation Plan process and the full suite of projects now under consideration in that process would have large impacts on the Delta and would affect the coequal goals. ~~However, completion and full implementation of the Bay Delta Conservation Plan is not equivalent to satisfying the Act.~~

## Transparency and Communications Plan to Implement the Delta Plan

The Council is committed to transparency and effective participation in its processes. To that end, the Council requires full transparency in information provided to it and timely public posting of information relevant to its actions. It will post all communications received.

The Council also seeks strong working relationships with agencies and stakeholders. Important components of those effective working relationships are procedures that ensure transparency and robust procedures for early consultation that are used consistently.

Decisions of the Council will be posted on its website. A public list of policies and plans determined to be consistent and not consistent with the Act shall be maintained on the Council website and included in reports of the Council on its effectiveness in implementing the Act.

Where required by law or as it deems feasible and appropriate, the Council will provide findings for its actions, which shall be posted publicly.

Information developed by the Council or provided to the Council shall be publicly accessible on the Council's website.

## References

- National Research Council, Committee on Defining the Best Scientific Information Available for Fisheries Management. 2004. Improving the use of "Best Scientific Information Available" Standard in Fisheries Management. National Academy Press, Washington D.C. Available from [http://www.nap.edu/catalog.php?record\\_id=11045#toc](http://www.nap.edu/catalog.php?record_id=11045#toc) (accessed July 2010).
- Sullivan, P. J., J. M. Acheson, P. L. Angermeier, T. Faast, J. Flemma, C. M. Jones, E. E. Knudsen, T. J. Minello, D. H. Secor, R. Wunderlich, and B. A. Zanetell. 2006. Defining and implementing best available science for fisheries and environmental science, policy, and management. American Fisheries Society, Bethesda, Maryland, and Estuarine Research Federation, Port Republic, Maryland. Available from [http://www.fisheries.org/afs/docs/policy\\_science.pdf](http://www.fisheries.org/afs/docs/policy_science.pdf) (accessed July 2010).



# Chapter 4

## A More Reliable Water Supply for California

California has outstripped the capacity for its existing infrastructure to satisfy the economic, environmental, and social demands for water (Hanak et. al. 2011). The state uses more groundwater than nature replenishes (Department of Water Resources 2009). Since 1914, the State Water Resources Control Board has issued permits for the diversion [and use](#) of water from the Delta [and its watershed](#), but total actual diversion [and use](#) amounts are currently unknown [in many areas of the state](#) and may be unsustainably over-allocated (State Water Resources Control Board 2008b). [In addition, there is evidence that a significant amount of water diverted and used within the Delta that is not based on, or is in excess of, any demonstrable water right. Enforcement to prevent these illegal diversions has been virtually non-existent, resulting in the reduction in the amount of water available to legal diverters and to instream flow needs.](#) Conflicts over California's water supplies have reached a point where the Legislature has found "the Sacramento-San Joaquin Delta watershed and California's water infrastructure are in crisis and existing Delta policies are not sustainable" (Water Code section 85000).

Variability of water availability is perhaps one of the most dominant characteristics of the state's water supply system. Most of the state's water originates as precipitation that falls during winter months, with about two-thirds of the available runoff coming from the mountains in northern California (Hanak 2011). California has developed a complex and interconnected system of surface reservoirs, aqueducts, and water diversion facilities that store and convey water from areas that have water available for use to urban and agricultural areas that have water needs. These systems were designed during the mid 20th century with minimal consideration of the harm that these water diversions could cause to the environment and native fisheries. As a result, [development and use of the water supply system is one of the many factors that have contributed to the decline in](#) California's native Delta ecosystem ~~is in decline~~.

One of the Delta Reform Act's key objectives is "to provide a more reliable water supply for the state" (Water Code section 29702). Therefore, the Delta Plan focuses on policies and recommendations that will increase the reliability of water supplies in the state that are available to meet demands while, at the same time, reducing local and regional reliance on Delta exports [for their future water supply needs](#) (Water Code section 85021). A responsible plan to improve water supply reliability in the state must address the problem on all fronts: [continue to reduce per capita](#) ~~control~~ water demand and improve conservation; deal with infrastructure limitations on storage and conveyance; [through smarter approaches to water supply operations and regulation, habitat improvement and other actions, restore the ability to divert and use supplies lost to environmental regulation while more effectively protecting and restoring environmental values](#) ~~ensure that water flow standards to protect and restore the Delta ecosystem are updated and enforced~~; and develop additional local and regional water supplies through improved groundwater management, water reuse, groundwater treatment, stormwater capture and recharge, and desalination. Ultimately, ~~water supply~~ reliability [of future water supply needs](#) for the state [largely](#) will be achieved at



the regional level through a combination of sustainable water management, regional self-reliance and water balance, and improved conveyance and storage.

## Policies and Recommendations

### Improve Regional Water Self-Reliance

Since the early 1980s, California has recognized the importance to the state of improving regional water supply self-reliance through conservation and the increased development of local and regional water supplies. These programs and projects increase the reliability of the state's water supplies by lowering ~~controlling~~ overall demand for the state's ~~limited~~ water resources and providing a diverse array of water supplies that often are more resilient under drought, emergency shortage, and climate change conditions.

All regions were originally established with available local supplies. As regions grew, some areas turned to importing water supplies to accommodate anticipated growth. Now as conflict increases on imported supplies, there is a need to enhance local and regional water supply development ~~often makes water available~~ from sources that ~~historically~~ have been unrecognized, underutilized, or unavailable. Decreased reliability of imported supplies, technological advances, and regional collaboration and innovation has made this possible. Recycled water provides an opportunity to use the same water several times before it reaches the ocean.<sup>2</sup> With additional treatment, groundwater that has been rendered non-potable by natural or human introduction of contaminants can be transformed into a drinking water supply. Similarly, desalination allows saline water to be used for drinking water. Stormwater that previously has been channelized to limit flooding and sent to the ocean can be recaptured and used for groundwater recharge (City of Los Angeles, UWMP 2010). Improved local storage, both surface and groundwater, increases the flexible management of water supplies statewide, especially through local conjunctive management programs (Hanak et al. 2011). Even retail and wholesale water rate structures can play a ~~critical~~ role in ensuring that residential and business customers and agricultural users understand the value of the water they use and do their part to conserve the state's water resources. While improvements to statewide water infrastructure remain critically important to long term water supply reliability, California has a wealth of local water resources that can be developed to improve regional self reliance and help achieve the coequal goals in the near term.

ADDITIONAL INFORMATION TO BE PROVIDED ON REGIONAL SELF-SUFFICIENCY USING EXAMPLES FROM APRIL WORKSHOP AND OTHERS WHO HAVE ALREADY EFFECTIVELY INCORPORATED A WATER SUSTAINABILITY /REDUCED DELTA DEPENDENCY ELEMENT IN THEIR URBAN AND AGRICULTURAL WATER MANAGEMENT PLANS/IRWMPs

The State has promoted local and regional water supply planning by requiring local agencies to develop plans, such as Urban Water Management Plans and Agricultural Water Management Plans, that forecast sources of supply and the actions needed (including demand management) to ensure that future demands are met over the next 25 years.<sup>3</sup> Since 2000, the State has also promoted voluntary integrated regional water management planning, recognizing that collaboration among the agencies within a watershed provides opportunities for better water management decisions and coordinated infrastructure

<sup>2</sup> DWR, 2009: Value of water recycling in stretching local water supplies by increasing the number of times that water is used and reused before it reaches the ocean.

<sup>3</sup> Requirement as a condition to receive state funding for water infrastructure from grant and loan programs administered by the state.



investments.<sup>4</sup> Over \$2 billion in State bond funds have been made available to support implementation of projects identified in these plans.

Overall, statewide progress in increasing local and regional water supplies is being made. As of 2011, the Department of Water Resources reported that over 90 percent of the state's population was covered by locally approved integrated regional water management plans. The 2009 California Water Plan indicates that statewide water use efficiency has improved, water recycling is expanding, and other local and regional water supplies are increasing. Most notable are the outstanding water management successes of major population areas, such as the City of Los Angeles, where future new water demands are now projected to be met only through increased conservation and local water supplies (Hanak et al. 2011).

With the enactment of the Delta Reform Act of 2009, it is now the policy of California to reduce reliance on the Delta in meeting future water supply needs [through investment in improved regional water supplies, conservation, and water use efficiency](#) (Water Code section 85021). The Act requires that "each region that depends on water from the Delta watershed shall improve regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects and improved regional coordination of local and regional water supply efforts" (Water Code Section 85021).

However, while voluntary planning and reporting on conservation and water supply projects may occur in a regional context, the decisions to fund and implement these projects remain under the control of individual water agencies. To promote statewide sustainable water use and ensure compliance with the Delta Reform Act, water agencies need to identify their actions and investments to implement conservation and water supply projects and explain how these projects are contributing to regional self-reliance and reduced reliance on the Delta. The state's progress in meeting its regional self-reliance goals should be summarized in future California Water Plan updates.

## ***Problem Statement***

Additional local and regional conservation and water supply development is needed to improve regional self-reliance in order to reduce reliance on the Delta [for future water supply needs](#) and achieve the coequal goals.

## ***PoliciesRecommendations***

~~The following policies (WR P1, WR P2, and WR P3) only apply as regulatory policies as follows:~~

- ~~A. A covered action involving the export of water out of the Delta, or involving the transfer of water through the Delta, is inconsistent with the Delta Plan if the need for that covered action is significantly caused by a recipient region's failure to comply with policies WR P1, WR P2, and/or WR P3.~~
- ~~B. A covered action involving the use of water in part or in whole in the Delta is inconsistent with the Delta Plan if the need for that covered action is significantly caused by the water using region's failure to comply with policies WR P1, WR P2, and/or WR P3.~~

~~In all other situations, WR P1, WR P2, and WR P3 are recommendations.~~

WR RP1 To promote statewide accountability in achieving the coequal goals, [the Council recommends that the Legislature and Governor enact legislation requiring](#) water suppliers that deliver water

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<sup>4</sup> An Integrated Regional Water Management Plan must be approved by the Department of Water Resources to receive bond funding for implementation of identified projects.

diverted or exported from the Delta or the Delta watershed ~~to shall~~, by December 31, 2015, include a new Water Sustainability Element in their Urban Water Management Plan and/or Agricultural Water Management Plan (or an equivalent plan). The Water Sustainability Element shall detail how water suppliers are improving regional self-reliance and reducing dependence on the Delta through investments in local and regional programs and projects. At a minimum, the Water Sustainability Element shall include:

**A Plan for Possible Interruption of Delta Water Supply:** Identify how reliable water service will be provided for a minimum period of at least six months in the event the Delta's export operations are interrupted during an average water year, dry water year, and following three dry water years.

**Evaluation of Planned Investments in Water Conservation and Water Supply**

**Development:** Identify specific programs and projects that will be implemented over the twenty year planning period and how they contribute to the improvement of regional self-reliance and reduced dependence on the Delta, including:

- ☐ Water Conservation and Water Use Efficiency
- ☐ Local Groundwater and Surface Storage
- ☐ Conjunctive Use Programs
- ☐ Water Recycling
- ☐ Use of Currently Non-Potable Groundwater
- ☐ Storm Water Capture and Recharge
- ☐ Saline Water and Brackish Water Desalination

- φ **Evaluation of Regional Water Balance:** Provide an assessment of the long term sustainability of water supplies to meet projected demands within the supplier's hydrologic region, as defined by in the 2009 California Water Plan Update, over the twenty year planning period. If the region lacks balance, indicate the steps that are being taken through the Integrated Regional Water Management Plan to bring the region into balance. If the region is not in balance and its Integrated Regional Water Management Plan is not available or does not identify the steps being taken to bring the region into long-term balance, then describe how the supplier's programs and projects are helping to bring the region into balance.

- φ **Sustainable Water Rate Structure:** ~~Evaluate~~Describe the degree to which the supplier's current rate structure ~~either sustainably encourages and supports~~ or reflects the cost of supplying the resource.

**ADDITIONAL OPTIONS FOR COUNCIL CONSIDERATION:**

Recommend that the Legislature and Governor enact a requirement that ~~Require the addition of~~ a Water Sustainability Element must be included in Integrated Regional Water Management Plans. The element should includes an assessment of the long term sustainability of water supplies to meet projected demands and, if the region is out of balance, a requirement for the implementation of local and regional programs and projects that will achieve regional water balance within the twenty year planning horizon. ~~To be consistent with the Delta Plan, The legislation could require~~ would to be required to be part of a Department of Water Resources-approved Integrated Regional Water Management Plan with a Water Sustainability Element the meets the regional water balance criteria.

~~Convert regulatory policy stated above into a recommendation.~~ Provide recognition/incentive to water suppliers that have achieved regional water balance or have demonstrated long-term

improvement in regional self-reliance and reduced dependence on the Delta. Recommend that state agencies which administer state grants or loans to fund water projects or programs include in their funding criteria a priority for Integrated Regional Water Management Plans (or individual water suppliers) that can demonstrate through their adopted Water Sustainability Element that they have achieved Regional Water Balance (or that, as a water supplier, they have improved regional self-reliance and reduced their dependence on Delta diversions).

WR ~~PR~~2 Water suppliers that deliver water diverted or exported from the Delta or the Delta watershed ~~should shall, at a minimum,~~ meet the standards and timelines established in Water Code section 10608 et seq. and section 10800 for urban and agricultural water use efficiency.<sup>5</sup> Recommend that state agencies that administer state grants or loans to fund water projects or programs include in their funding criteria a priority for water suppliers that meet the standards in Water Code sections 10608 et seq. and 10800.

WR ~~PR~~3 Retail water suppliers that deliver water diverted or exported from the Delta or the Delta watershed ~~shall should,~~ by December 31, 2020, develop and implement a rate structure that ~~sustainably encourages and supports water conservation which may include the adoption of a water budget-based rate structure~~ is consistent with the California Urban Water Conservation Council's Best Management Practice for retail conservation pricing as shown in Exhibit 1 of the "Memorandum of Understanding Regarding Urban Water Conservation in California", to the extent allowed by regulation. Recommend that state agencies that administer state grants or loans to fund water projects or programs include in their funding criteria a priority for water suppliers that have implemented rate structures that sustainably encourage and support water conservation.

## **Recommendations**

WR R~~4~~ If the legislation recommended in WR R1 is enacted, The California Department of Water Resources, in consultation with the Council, the State Water Resources Control Board and others, should develop and approve, beginning one year after enactment by December 31, 2014, Urban Water Management Plan and Agricultural Water Management Plan guidelines for a Water Sustainability Element, based on the criteria contained in WR ~~PR~~1.

WR R~~5~~ If the legislation recommended in WR R1 is enacted, Beginning one year after enactment in 2016, State agencies should prioritize state funding for water agencies in the state that have a complete Water Sustainability Element in their adopted Urban Water Management Plans and/or Agricultural Water Management Plans and or Integrated Regional Water Management Plans.

WR R~~6~~3 A proponent for a new proposed point of delivery ~~from the State Water Project~~ that results in increased demand for diversions from or use in the Delta or the Delta Watershed should demonstrate that the project proponents have evaluated and implemented all other feasible water supply alternatives.

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<sup>5</sup> SB X7-7, also known as the 20% by 2020 legislation, was enacted in 2009. For urban water suppliers, the law requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020, with incremental progress measured by a 10% reduction by December 31, 2015. Agricultural water suppliers are required to measure the volume of water delivered to customers, adopt a pricing structure based at least on quantity delivered and implement additional conservation measures that are locally cost effective and technically feasible by July 31, 2012. A report on efficient water management practices is required to be included in the supplier's agricultural management plan. In addition, the act requires agricultural management plans to be completed by December 31, 2012, with an update by December 15, 2015, and every five years thereafter. Urban and agricultural water suppliers are ineligible for state water grants or loans unless they are in compliance with the act.

## **Program to Improve Conditions in the Delta and Address Other Stressors to Provide a More Reliable Water Supply**

Over the last two decades the State Water Project and Central Valley Project have lost significant water supply reliability due to environmental regulation. At least to some extent, these losses have been incurred due to the use of flow as a surrogate to mitigate negative impacts not caused by project operations, but by habitat degradation and other stressors. Smarter approaches to water project regulation and flow requirements based on better science that actually focus on cause/effect relationships should be developed and implemented. Just as importantly, habitat improvements and implementation of programs to address the numerous other stressors impacting the Delta will mitigate for their direct impacts on the Delta ecosystem. Chapter 5 describes the habitat degradation and negative impacts of other stressors and provides a number of policies and recommendations to cure that degradation and those impacts. Implementation of those measures will directly address these underlying factors causing or contributing to degradation of the Delta and its resources and will reduce that portion of the regulatory burden that has been imposed on the export projects to mitigate for these other factors. Implementation of the restoration actions included in Chapter 5 will enable the projects to restore a measure of the supply reliability that has been lost and contribute to meeting the goal of providing a more reliable water supply.

## **Delta Instream Flow Criteria and the Setting of Flows**

Long-standing California law has granted to the State Water Resources Control Board considerable authority in the areas of water rights, water quality protection, and the setting of instream water flow criteria. In addition, the State Water Resources Control Board has the authority to enforce the Public Trust Doctrine and the provisions of the California Constitution, in Article X, Section 2, which pertain to the reasonable and beneficial use of water resources of the state to the fullest extent of which they are capable in the public interest.

Unfortunately, as California's water supply has tightened—as the demands for water have increased and the sources of supply become more volatile—the State Water Resources Control Board has been at the center of political disputes over how its decisions on water allocations should be made. Often, the decisions needed to protect the State's interests in ecosystem protection and water supply reliability have been blocked by battles among competing interests, by inadequacies in the science supporting proposed actions or by recent degraded conditions in the Delta and inadequate infrastructure. In addition, many major factors, most of which are not within the State Water Resources Control Board's authority, have degraded the environment of the Delta and its watershed and caused significant reductions in water supply for human uses. The resulting situation downward spiral in which the state now finds itself, with native fish populations crashing and reduced reliability of water exports from the Delta, is unsustainable.

If the coequal goals are to be achieved, it is essential that the State Water Resources Control Board expeditiously carry out its responsibility to complete the work to set flow-reasonable water quality objectives and flow criteria for the Delta and the major tributary streams in the Delta watershed. In doing so, the State Water Resources Control Board must identify the other factors impacting the Delta and its watershed, including recommendations for appropriate action by entities with authority over those other factors (Water Code section 13242). The state cannot afford further delay. It is impossible for the state to plan and build a reliable water system where future ecosystem flow requirements are not known. This is true everywhere in the State but especially true in the Delta. Water suppliers cannot commit to funding new projects and making effective decisions about billions of dollars of infrastructure investments until the State Water Resources Control Board process is complete. Until the flow issue is resolved, every action that potentially increases the amount of water diverted from or moved through the Delta is vulnerable to legal challenge over the question of whether there are sufficient flows to protect and restore the environment.

The State Water Resources Control Board is in the midst of a phased process to review and amend—or to adopt new—[flow water quality objectives and flow requirements](#) for the Delta and its high priority tributary streams. The State Water Resources Control Board has set a work plan and schedule for developing flow standards for the Delta and its watershed. The first step was taken in 2010, when the State Water Resources Control Board completed its report on the *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* (State Water Resources Control Board 2010a). This study provides an assessment of the flows needed to protect the Delta and its ecological resources and does not include other public trust considerations, [or consider the reasonableness of the criteria when balanced against the public interest in the consumptive needs for water, probable future supply needs, economic considerations and control of other factors.](#) (See Water Code sections 13000 and 13241). [The Legislature, in directing the State Water Resources Control Board to take this narrow focus, explicitly recognized the limitations of the flow criteria report by limiting its use to planning \(rather than regulatory\) purposes and providing that the criteria were not to be predecisional. \(Water Code section 85086\(c\)\(1\) While only the starting point for the broader flow standard setting process.](#) However, the report underscores the importance to California of resolving, [as soon as possible, what the appropriate those future flow regimes need to be in the larger context of control of the other factors impacting the Delta and its watershed and the other actions that will be taken as part of the Delta Plan.](#)

Currently, the State Water Resources Control Board is in the process of addressing San Joaquin River flows and expects to complete the first phase of this process by June 2012. The State Water Resources Control Board is coordinating with the Department of Water Resources in its preparation of the Bay Delta Conservation Plan and may consider environmental documentation developed for the Plan in its proceedings. In December 2010, the State Water Resources Control Board completed a prioritized schedule and estimate of costs to complete the instream flow studies for the Delta, in accordance with Water Code Section 85087 (State Water Resources Control Board 2010b).

## **Problem Statement**

The State Water Resources Control Board needs to [review and update Delta water flow requirements as appropriate standards.](#)

## **Policies Recommendations**

WR ~~R7~~P4 The State Water Resources Control Board should [continue to expeditiously complete review of water quality objectives and Delta flow requirements and take steps to implement any revised objectives and flow requirements through water rights proceedings consistent with its “Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary” adopted July 2008. This review should include the flow studies required for high priority rivers and streams in the Delta Watershed, San Joaquin River and its tributaries by Water Code section 85087 by no later than the dates proscribed in that section and the SWRCB’s current consideration of amendments to the San Joaquin River flow objectives. develop flow criteria and establish flows as follows:](#)

WR R8 The State Water Resources Control Board’s program of implementation for water quality objectives and flow requirements should address the control of other factors impacting the Delta and its watershed as necessary to achieve the objectives, including recommendations for appropriate action to other agencies (Water Code section 13241).

- ~~⊕ By June 2, 2014, adopt and implement flow objectives for the Delta that are necessary to achieve the coequal goals.~~
- ~~⊕ By June 2, 2018, develop flow criteria and establish flows for high priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.~~



- ~~φ Prior to the dates indicated in (a) and (b), existing Delta flow objectives shall be used to determine consistency with the Delta Plan. If the State Water Resources Control Board fails to act by the dates indicated, the Council will XXX.~~

**~~OPTIONS FOR COUNCIL CONSIDERATION FOR CONSEQUENCES IF FLOWS NOT ADOPTED:~~**

- ~~— The Council could use the flow criteria identified by the State Water Resources Control Board from its report on the *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* (2010) to determine consistency of covered actions with the Delta Plan.~~
  - ~~— Determine that a covered action that would increase the capacity of any water system to store, divert, move, or export water from the Delta and/or the Delta Watershed would not be consistent with the Delta Plan until the revised flow objectives are implemented.~~
- ~~Recommend that the Board cease issuing water rights permits in the Delta and the Delta watershed (or, if the absence of flow criteria is specific to one or more of the major tributaries, then the constraint could be focused to the impacted areas).~~

## Statewide Storage and Conveyance

California's water storage and conveyance system was designed to capture, transport, and deliver water to urban and agricultural end users. This infrastructure was not originally designed to protect ecosystem values and, in its current configuration, is not sufficiently flexible to meet the coequal goals of ecosystem protection and improvements to the state's water supply reliability (Hanak et al. 2011).

Conveyance capacity does not match water storage. During the key times when storage space is available, or there is current demand for water, water often cannot be pumped because the current Delta conveyance system impacts one or more listed species. This issue is being addressed through the Bay Delta Conservation Plan, but improvements in storage and conveyance will be needed while the Bay Delta Conservation Plan is being developed.

Today, the amount of storage capacity is inadequate, especially south of the Delta, to permit water users to take water at times when there is water in the Delta that can be diverted (Hanak et al. 2011). For example, in the spring of 2011, the south Delta pumps were turned off since urban and agricultural water users' needs were met by other water supplies, and storage locations south of the Delta could not take the available water. Looking ahead, these infrastructure challenges will be compounded by the predicted impacts of climate warming on the state's water supplies, as precipitation and runoff patterns shift and sea level rise increases the vulnerability of the Delta to floods. The State Water Project, which owns and operates the lowest elevation dams in the state's water system and controls the Delta intakes for the state system, is particularly vulnerable to these changes (Knowles and Cayan 2002).

In the past decade, the Department of Water Resources has expended tens of millions of dollars on integrated storage investigations to evaluate how surface storage and conveyance may be improved. These studies have confirmed the need for expanded infrastructure; however, as yet, there is no consensus on which storage or conveyance projects the state should select. Even when a decision is made, many of the proposals being studied, especially for the large dam sites, have substantial environmental, political, and financial challenges that may delay or even preclude their construction.

The state must be prepared for the possibility that it could take many more years for the state to select, build, and operate large-scale storage and conveyance improvement projects. As an interim step toward increasing the state's water supply reliability, the state should consider smaller, more incremental operational and storage improvements at existing facilities that can be accomplished within the next 5 to

10 years. In addition, the state needs to consider how groundwater storage and especially conjunctive management programs (in combination with conservation, local water supplies such as stormwater capture and recycled water, and water transfer programs) may significantly enhance the operational flexibility of the state's system and improve the state's water supply reliability.

### **Problem Statement**

Improvements in conveyance and storage are needed to provide more operational flexibility.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

WR R<sup>94</sup> The California Water Commission should hold hearings to identify and evaluate how large-scale storage and incremental improvements to surface and groundwater storage infrastructure and operations may be made in the Delta watershed and in areas that use water from the Delta over the next five to ten years to help achieve the coequal goals.

## **Reporting, ~~and~~ Transparency and Enforcement**

Despite the importance of improving water supply reliability to the state and its economy, California does not have complete ~~has limited~~ information on which to base sound water management decisions. ~~Due to the lack of standardized monitoring and reporting requirements, the state does not know how much water is available or used annually.~~ Since 1914, the State Water Resources Control Board has issued permits for the diversion and use of water from the Delta and in its watershed, but due to the lack of standardized monitoring and reporting requirements, how much water is available and total actual diversion amounts are currently unknown in many areas of the state and may be unsustainably over-allocated (State Water Resources Control Board 2008b). In addition, there is evidence that a significant amount of water diverted and used within the Delta that is not based on, or is in excess of, any demonstrable water right. Enforcement to prevent these illegal diversions has been virtually non-existent, resulting in the reduction in the amount of water available to legal diverters and to instream flow needs. In other regions of the state, water is pumped more quickly out of the ground than it is replenished (Department of Water Resources 2009).<sup>6</sup> Chronic groundwater overdraft statewide—essentially groundwater mining—has been estimated by the Department of Water Resources to be as high as 2 million acre-feet on a yearly average; however, recent satellite measurements of groundwater elevations within the Central Valley alone suggest that the overdraft in the last 7 years has resulted in the loss of 16.5 million acre-feet of groundwater storage (Famiglietti et al. 2011).

In recent years, the state has made a significant effort to quantify and report water use estimates by sector as well as by major hydrologic regions of the state through the California Water Plan (Department of Water Resources 2009). However, much of the water data that is available to the state from local, regional, state, and federal agencies and organizations is collected by these entities using differing methodologies and levels of detail (Hanak et al. 2011). Some data is reported on only a voluntary basis, such as the submission of annual data on regional groundwater elevations to the Department of Water Resources or the submittal of water conservation data to the California Urban Water Conservation Council, which, in 2008, was done by only 225 of the largest urban water suppliers (about half of agencies that could report). But even mandatory sources of local and regional water supply and use data, such as the Urban Water Management Plans that urban retail and wholesale water agencies (serving more than 3,000 customers) are required to update and submit to the Department of Water Resources every

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<sup>6</sup> Chapter 8 Conjunctive management and Groundwater Storage, Vol 2, Resource Management Strategies

5 years, do not use standardized data collection formats nor are they compiled electronically in a central data base. The information from these plans is important, but it is difficult to aggregate on a similar basis ~~inaccessible and as a result virtually useless~~ for the purpose of evaluating statewide water conservation and local water supply development trends that will contribute to the improvement of the state's overall water supply reliability.

~~Another important potential source of information about the state's water supplies are the contracts and transfer agreements involving water from the State Water Project. These documents are not developed through an open and transparent public process, and the resulting contracts and agreements, when released to the public, are difficult to understand, much less to evaluate for their implications for the state's water resources. By comparison, the Bureau of Reclamation has adopted and uses procedures that ensure that contracts and transfer agreements involving water from the Central Valley Project are developed in full view of the public, from the proposal stage through negotiations to the final decision-making. In addition, the Bureau of Reclamation requires the submission of a standardized annual report from entities that receive water from the Central Valley that includes a full water balance, including production from all sources, system losses, and changes in storage and water use as a condition in its contracts and transfer agreements (U.S. Bureau of Reclamation 2011).~~

## **Problem Statement**

Improved information needed on water use and management in California.

## **Policies Recommendations**

WR ~~R10~~P5     The Legislature should consider amendments to the Water Code to standardize the collection and compilation of data regarding diversion and use of water from the Delta and its watershed. To be consistent with the Delta Plan, future contracts and agreements to export water from the Delta and/or to move water through the Delta shall be developed in a transparent manner consistent with the public process employed by the U.S. Bureau of Reclamation for Central Valley Project water supply contracts and transfers.

WR R11 The Legislature should consider amendments to the Water Code to expand the State's ability to enforce water rights by explicitly authorizing SWRCB to hire administrative law judges or similar hearing officers with authority to review and enforce proscriptions against illegal diversions. Funding should be designated to provide adequate resources to support these investigations and adjudications.

## **Recommendations**

WR ~~R12~~R5     The Department of Water Resources, in coordination with the State Water Resources Control Board, Regional Boards, the Department of Public Health and the Council, should complete the proposed Water Planning Information Exchange (Water PIE) by January 1, 2014. This new electronic system should consolidate information in an electronic format and make it available online. It should be designed to simplify reporting processes, reduce the number of required reports, and be coordinated with the reporting requirements for the Urban Water Management Plans/Agricultural Water Management Plans and Integrated Regional Water Management Plans. Water users that receive water diverted or exported from the Delta or the Delta watershed should be full participants in the Water PIE when it becomes available. The information collected through the Water PIE should be published and incorporated in the analysis for the California State Water Plan Update every five years.



## Groundwater

Groundwater is a major source of California's water supplies. It provides roughly 30 percent to 40 percent of the state's gross urban and agricultural water use (Hanak et al. 2011). Despite the critical nature of this water supply to the state, especially during dry years, California does not have a statewide management program or statutory permitting system for groundwater. Improved groundwater management, especially in basins that are chronically over-pumped, is needed to achieve the coequal goals.

The state has a long history of managing groundwater through locally controlled activities. In several areas of the state, local and regional agencies have developed voluntary sustainable groundwater plans and some have adopted groundwater ordinances under their police powers. In others, groundwater overdraft, contamination, and other serious water management problems have forced the adjudication of groundwater basins through court or administrative proceedings and to the establishment of mandatory sustainable groundwater management criteria including "safe-yield" and replenishment obligations.

The state has tried to encourage voluntary development of locally controlled groundwater management plans through AB 3030, SB 1938, AB 303, and the Integrated Regional Water Management program (Propositions 50 and 84) and by limiting availability of state funding (bonds or state revolving fund loans) for water infrastructure only to those agencies that have these plans in place. However, local groundwater management plans are required to comply with only 6 out of the 14 plan core elements recommended by the Department of Water Resources, which means that the plans can qualify for funding without fully providing for sustainable management of the groundwater basins (Department of Water Resources 2008). Additionally, the 2009 Delta Reform Act established a voluntary program for the collection of groundwater elevation data.<sup>7</sup> The Department of Water Resources has created the California Statewide Groundwater Elevation Monitoring Program (CASGEM), which will collect groundwater elevations and make the data available online. The first reporting deadline is January 1, 2012.

Although the state has made progress in encouraging more sustainable management of groundwater, unregulated pumping and severe groundwater overdraft in some regions of California has created serious economic and environmental consequences. A recent simulation of groundwater conditions in the Central Valley for 1962–2003 estimates that groundwater storage has decreased by almost 58 million acre-feet (Faunt et al. 2009). Additionally, a recent NASA study using data from the Gravity Recovery and Climate Experiment (GRACE) satellite mission suggests that 16.5 million acre-feet were taken out of groundwater storage in the Central Valley between October 2003 and March 2010 (Famiglietti et al. 2011). The costs of chronic overdraft in terms of damage to streets, bridges, canals, and the aquifer itself resulting from subsidence, reduced groundwater availability during droughts, groundwater quality, higher pumping costs to other water users in the region, and environmental damage to streams and wildlife are significant.

Further, the state has not conducted a comprehensive assessment of California's groundwater basins using field data since Bulletin 118-80 was published in 1980—over 30 years ago. The Department of Water Resources provides an estimate of groundwater conditions, including overdraft, in Bulletin 118 updates as well as in the California Water Plan, but the numbers need to be further substantiated with current data and analysis. The Department of Water Resources is in the process of updating the California Water Plan (2013) and has initiated an effort to expand information about statewide and regional groundwater conditions and will include case studies to illustrate successful regional strategies and opportunities for conjunctive management, groundwater banking, and integrated flood management.

Information on changes in groundwater storage, as well as on groundwater overdraft, are vital to the sustainable management of California's groundwater resources and to improved reliability of the state's

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<sup>7</sup> SBx7-6 (Senate Bill 6) adds to and amends parts of Division 6 of the Water Code, specifically Part 2.11 Groundwater Monitoring. The law requires that local agencies monitor and report the elevation of their groundwater basins to help better manage the resource during average water years and drought conditions.

overall water supplies. This information is also a critical element in the CALSIM modeling used by the Department of Water Resources to evaluate State Water Project water operation scenarios and resulting environmental impact assessments. The state needs this information to sustainably manage California's groundwater resources and to improve reliability of the state's water supplies.

### **Problem Statement**

Sustainable groundwater management is needed.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

- | WR ~~R12R6~~ The Department of Water Resources, in collaboration with the U.S. Geological Survey and other federal, state and local agencies, should update Bulletin 118 using field data, California Statewide Groundwater Monitoring Elevation Monitoring (CASGEM), groundwater agency reports, satellite imagery and other best available science by January 1, 2015. This information will be available for inclusion in the Urban Water Management Plans and Agricultural Management Plans that are required to be submitted to the state by December 31, 2015.
- | WR ~~R13R7~~ To be consistent with the Delta Plan, water suppliers that deliver water diverted or exported from the Delta or the Delta watershed and that receive a significant percentage of their water supplies from groundwater sources should develop sustainable groundwater management plans that are consistent with both the required and recommended components of local groundwater management plans identified by the California Department of Water Resources (Bulletin 118, Update 2003).
- | WR ~~R14R8~~ Local and regional agencies in groundwater basins that have been identified by the Department of Water Resources as being in chronic overdraft should develop a sustainable groundwater management plan, consistent with both the required and recommended components of local groundwater management plans identified by the California Department of Water Resources (Bulletin 118, Update 2003), by January 1, 2015. If local or regional agencies fail to develop and implement these groundwater management plans, the State Water Resources Control Board should take action to determine if the continued overuse of a groundwater basin constitutes a violation of the state's Constitution Article X, Section prohibition on unreasonable use of water and whether a groundwater adjudication is needed to prevent the destruction of or irreparable injury to the quality of the groundwater.

## **Performance Measures**

- φ Improved Regional Self-Sufficiency
  - Conservation – status of progress in achieving 20 percent by 2020 and other SBx7-7 requirements
  - Local water supply development (total and by type of supply)
  - Percentage of retail water rate structures that promote water conservation
- φ ~~Reduced dependence on the Delta~~
  - Percentage of plans that identify actions that will reduce ~~are reducing~~ future dependence on the Delta watershed

- φ Improved regional water balance
  - [Whether legislation requiring Number of Urban Water Management Plans/Agricultural Water Management Plans/Integrated Regional Water Management Plans ~~that have completed to include~~ a Water Sustainability Element has been enacted, and if so how many plans include such an element and developed have a plan for achieving regional water balance](#)
- φ Improved reliability of State Water Project deliveries
  - Report in terms of long-term average reliability of the system
- φ [Improved enforcement to prevent illegal diversions within the Delta](#)
- φ [Percent of groundwater aquifers, that are used to meet urban water needs of 3,000 people or more and/or xx acres of irrigated agriculture \(consistent with AWMP requirements\), are managed or adjudicated. ~~Number of AB-3030 groundwater management plans \(with all Department of Water Resources identified requirements and recommendations\) in place~~](#)
- φ Status of Water PIE development, implementation and participation

## References

- City of Los Angeles. 2010. Draft 2010 Urban Water Management Plan.
- Department of Water Resources. 2003. California's Groundwater. Bulletin 118, Update 2003. Sacramento, CA.
- Department of Water Resources. 2009. California Water Plan Update 2009.
- Dettinger, M. D., F. M. Ralph, T. Das, et al. 2011. Atmospheric Rivers, Floods and the Water Resources of California. *Water* 3(2):445-478.
- Famiglietti, J. S., M. Lo, S. L. Lo, et al. 2011. Satellites measure recent rates of groundwater depletion in California's Central Valley. *Geophysical Research Letters*, Vol. 38, L03403.
- Faunt, C. C., K. Belitz, and R. T. Hanson. 2009. Groundwater Availability in California's Central Valley. Groundwater Availability of the Central Valley Aquifer, California. Edited by C. C. Faunt. U.S. Geological Survey Professional Paper 1766.
- Hanak, E., J. Lund, A. Dinar, B. Gray, R. Howitt, J. Mount, P. Moyle, and B. Thompson. 2011. Managing California's Water: From Conflict to Reconciliation. San Francisco, CA. Public Policy Institute of California.
- Knowles, N., and D. R. Cayan. 2002. Potential effects of global warming on the Sacramento/San Joaquin watershed and the San Francisco Estuary. *Geophysical Research Letters*, 29, 38-1-38-4.
- State Water Resources Control Board. 2008a. Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/strategic\\_plan/docs/baydelta\\_workplan\\_final.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/strategic_plan/docs/baydelta_workplan_final.pdf).
- State Water Resources Control Board. 2008b. State Water Resources Control Board and Regional Water Quality Control Board (Water Boards) Response to Second Round of Delta Vision Questions. Letter to Delta Vision Task Force, June 12, 2008.
- State Water Resources Control Board. 2010a. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem. August 3. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/docs/final\\_rpt080310.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf).

State Water Resources Control Board, 2010b. Instream Flow Studies for the Protection of Public Trust Resources: A Prioritized Schedule and Estimate of Costs. December. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/instream\\_recommendations/index.shtml](http://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_recommendations/index.shtml).

U.S. Bureau of Reclamation. 2011. 3404(c) CVPIA Contract Renewal Process. Site accessed April 21, 2011. <http://www.usbr.gov/mp/cvpia/3404c/index.html>.



# Chapter 5

## Restore the Delta Ecosystem

The Act defines “restoration” as “...the application of ecological principles to restore a degraded or fragmented ecosystem and return it to a condition in which its biological and structural components achieve a close approximation of its natural potential, taking into consideration the physical changes that have occurred in the past and the future impact of climate change and sea level rise” (Water Code section 85066). The Act also recognizes the value of the Delta as “... the most valuable estuary and wetland ecosystem on the west coast of North and South America” (Water Code section 85022) and provides multiple references to specific features or ecosystem function to be “protected, restored or enhanced” in meeting the coequal goals.

An overarching goal for ecosystem restoration in the Sacramento-San Joaquin Delta Reform Act is to restore fisheries and wildlife to include more viable populations of native resident and migratory species. Doing so requires consideration of the ways that native species used native Delta landscapes to meet their needs at each stage of life. Native species are populations adapted to the historical climate, hydrology, and landscape pattern of the estuary (Grossinger et al. 2010). Therefore, it is a fundamental principle that conservation of native species is promoted by restoration of landscape attributes, connections, and processes at scales that allow for full expression of native species life history strategies (Moyle et al. 2010). Restoration of the current “domesticated” Delta back to the historical, “wild” landscape is not possible, but two categories of understanding help to meet restoration goals. The first is to understand historical patterns and processes to the extent we can. The second is to apply principles of landscape ecology so that restored ecosystems have adequately scaled patterns and processes, are resilient to disturbances, and give competitive advantages to native species.

## The Historical Delta Ecosystem

The Delta was historically a 700,000-acre mosaic of variable landscape types influenced by tides and river flows (historical Delta figure from Chris Enright using Brian Atwater data). Current research shows that overall, historical Delta landscapes were spatially quite stable, but showed considerable seasonal and interannual variability in flow characteristics and inundation patterns. The historical Delta can be divided into three primary landscapes. These landscapes can be classified into (1) flood basins in the north Delta, (2) tidal islands in the central Delta, and (3) distributary rivers (multiple branches flowing away from main channels) in the south Delta (Grossinger et al. 2010; Whipple et al. 2010, 2011).

The flood basins in the north Delta occurred at the interface between fluvial (riverine) and tidally influenced portions of the Delta where the Sacramento River entered the Delta. One defining characteristic of this region was a broad zone of non-tidal, freshwater, emergent plant-dominated wetlands that graded into tidal freshwater wetlands. These wetlands were dominated by dense stands of tules. In addition, shallow perennial ponds and lakes, riparian forests along natural levees, and seasonal wetlands were common features of the historical north Delta. The historical central Delta included about 200,000 acres of tidal islands with freshwater emergent plants that were inundated regularly by spring tides (tides when differences between high and low tides are the greatest). Banks of the tidal islands were

commonly covered in tules with willows, grasses, sedges, shrubs, and ferns on the islands themselves. The historical south Delta contained a complex network of distributary channels with low natural levees, large woody debris, willows, and other shrubs with upland areas supporting open oak woodlands. Historical data from the Delta paint a picture of rich habitat complexity at multiple spatial and temporal scales (Grossinger et al. 2010; Whipple et al. 2010, 2011).

Domestication of the historical Delta landscape and ecosystem over the past 160 years has involved constructing about 1,100 miles of levees, draining the lands behind the levees for crop production, and diverting water to the southern part of the state (Hanak et al. 2011). This has produced a rich agricultural and urban economy within the Delta and far beyond its borders, but it has come at a cost to the original estuarine ecosystem and its native species. Many native species are in decline, and some are close to extinction; one fish species already extinct. More than 90 percent of wetlands have been lost to diking and draining, and floodplains in and upstream the Delta have been cut off from rivers.

Most tributary rivers flowing to the Delta have been dammed. Access to areas critical to fish lifecycles is now greatly reduced, including reaches of tributary rivers and streams critical to the state's iconic salmon. The once pronounced seasonal and interannual flow variability has made way to more stable conditions, and the formerly highly complex landscape described above has been replaced by a much more uniform landscape resembling a simplified, spatially and temporally fixed grid of (fewer) river channels used for north-south and east-west water conveyance. The channels are abruptly separated by artificial levees from dry, farmed islands and interspersed by a few large and shallow open water areas (flooded islands).

Cultivation of the peat soils also has produced subsided islands (polders) where much of the Delta is now below sea level (Lund et al. 2010). Non-native species continue to increase in the San Francisco Estuary (Cohen and Carlton 1998), and Delta fish communities continue to change in composition with native pelagic (open water) fishes undergoing a recent sharp decline (Sommer et al. 2007, Healey et al. 2008). Ecosystem restoration within the Delta landscape will not restore the historical "wild" Delta, but knowledge of the historical Delta informs managing the future by identifying what landscape elements best fit various localities where restoration projects are practical and feasible.

## Landscape Ecology

Return to the historical Delta is not possible or even desirable, because ecosystems are always responding to natural and anthropogenic drivers of change (Folke et al. 2010). This is recognized in the definition of restoration in the Act with the goal of "...close approximation of its natural potential..." (Water Code section 85066). Envisioned restoration actions, although extensive, will nevertheless cover only a fraction of the Delta and its watershed. Therefore, effective Delta restoration requires strategies to make limited available land mimic historical landscape functions sufficiently enough that native species can use them to meet their needs. In this context, landscape restoration should not be defined by its extent alone. Rather, it is more usefully defined by relationships between interacting mosaics of elements that allow energy flows between them and corridor connections that species can navigate (Wiens 2002, Lindenmayer et al. 2008). Taking a landscape perspective and applying the principles of landscape ecology focuses on three concepts (Turner 1998). The first concept is that landscape patterns and the spatial scales at which they occur determine species responses. The landscape perspective identifies and describes the agents of pattern formation, including physical processes such as hydrology, chemical processes such as nutrient cycling, biological processes such as vegetation patterns, and the ways all processes can be "disturbed" by events such as floods and droughts. Second, the landscape perspective considers broader spatial extents than those traditionally studied in ecology. The emphasis is on identifying scales that support relationships between spatial heterogeneity and the life history of native species. For example, in the Delta, the characteristic length of the tidal excursion is a spatial scale and pathway that ties together different habitat types within one-half of a tidal cycle. Third, the landscape perspective explicitly considers the role of humans in creating and affecting landscape patterns and



process. Humans play a dominant role in influencing relationships between spatial patterns and ecological processes. Indeed, the restoration goals of the Delta Plan are an example of this influence.

The landscape perspective with its focus on spatial patterns is important to resource managers because context matters. Restored landscapes have neighboring land uses, including agriculture and urban areas. Each land use affects the other because they are connected by air, land, and water; yet humans desire often conflicting services from each. In addition, ecosystem function depends on the interplay of pattern and process over broad spatial extents and, therefore, necessarily includes the role of humans in creating and affecting these relationships. Finally, understanding that human activities can dramatically alter landscape context and the relationship between patterns and processes, resource managers have a stewardship responsibility to understand and manage these impacts.

## Ecosystem Restoration

Delta ecosystem restoration involves adaptive management (see Chapter 2) of landscapes, ecosystems, habitats, communities, and species. The word “ecosystem” has many definitions. One straightforward definition is “an ecological community together with its environment, functioning as a unit.” A more scientific definition is “a community of organisms together with their physical environment, viewed as a system of interacting and interdependent relationships and including such processes as the flow of energy through trophic levels and the cycling of chemical elements and compounds through living and nonliving components of the system.” Importantly, ecosystems also include people. Whole ecosystems have been a management focus for several decades. The early term “ecosystem management” has more recently made way to the scientifically more accurate term “ecosystem-based management,” which explicitly recognizes that humans cannot control many important ecosystem attributes and, thus, cannot deliberately manipulate or manage entire ecosystems—humans can really only control and manage human activities that affect ecosystems (McLeod et al. 2005). The goal of management aimed at whole ecosystems is the long-term protection of ecological processes, structures, and interconnections needed to maintain the health, productivity, and resilience of ecosystems so that they can provide the services humans want and need (Grumbine 1994, Christensen et al. 1996, Szaro et al. 1998, McLeod et al. 2005). The concept of ecosystem restoration involves returning ecosystem processes, structures, and interconnections to a more natural or healthy condition that can be sustained over the long term.

While ecosystem-based management and restoration is concerned with the whole system, specific management actions are often aimed at individual “elements of concern” such as individual species or communities and their habitats, and on the processes that generate and sustain these elements (e.g., selection, trophic interactions, element cycling, or disturbance). Furthermore, ecosystems exist at several spatial scales, but goal-oriented ecosystem management requires the identification of geographically bounded “places of concern” that exist in a larger landscape context (Lackey 1998). What is “of concern” reflects prevailing social and economic needs and values along with scientific understanding of the ecological processes and structures that sustain them. Definition of what is “of concern” is required to set actionable management goals and targets, but ecosystem management and restoration can and should not proceed without consideration of the larger social, ecological, and landscape context.

In the Delta, places of concern include regularly wetted places such as tidal marshes, brackish water marshes, floodplains, and channel margins as well as mostly dry places such as riparian zones and open and wooded upland areas. Processes of concern include the delivery of fresh and salt water; the transport, cycling, and deposition of sediments, nutrients, and contaminants; trophic interactions; and the colonization and succession involved in building biological communities. Together, the places and processes determine the quantity and quality of habitat available to species of concern in the Delta, such as desirable native resident and migratory species or harmful non-native species, and the human inhabitants of the Delta. Ecosystem goods and services of concern include the provision of fresh water, food, recreational opportunities, cultural heritage and spiritual benefits, and water and air purification.



What then constitutes successful ecosystem restoration within the Delta? Palmer et al. (2005) propose five criteria for measuring success from an ecological perspective. First, the project should be based on a clear guiding image of the type of dynamic and healthy ecosystem to be achieved. Second, the ecological condition must be measurably improved. Third, the ecosystem should be more resilient and self-sustaining to perturbations and disturbances. Fourth, construction should produce no lasting harm. Fifth, both pre-assessment and post-assessment must be completed with public communication of results. Standards of evaluation for each of the five criteria lead to logical performance measures for restoration projects.

It is important to realize that landscapes, and the ecosystems and habitats they contain are not static; they change over time in response to numerous natural and anthropogenic drivers of change (Manning et al. 2009, Harwell et al. 2010, Delta Independent Science Board January 2011). Change is inevitable, but more resilient landscapes and ecosystems can adapt without fundamentally or overly rapidly changing how they look and function (Folke et al. 2004). The capacity for ecological resilience is increasingly challenged worldwide by global drivers such as global climate change and human population growth, as well as by drivers once considered of more local importance, for example, past and present human land use (Foster et al. 2003, Foley et al. 2005). The Delta of the future must contend with two important drivers: (1) global drivers, such as sea level rise, increasing flow variability, and changing amounts of rain and snow; and (2) key local drivers, such as land use changes, nutrient additions, legacy and emerging contaminants, and altered hydrology.

What does a changing Delta mean to the fish communities that use the Delta? Lund et al. (2010) have considered how changing habitats and various conveyance options might affect fish populations of the future Delta. Their assessment led to five main conclusions. First, large-scale ecosystem change is inevitable, and the future Delta will be very different from both the current and historical Delta. Second, variability in water quality and the flow regime is necessary to reverse the decline to desirable fish species. Third, groups of fishes (smelt, anadromous, freshwater benthic, freshwater zooplanktivores, and slough-resident fishes) are favored by differing management strategies. Fourth, any water export strategy must restore habitat diversity and function throughout the Delta and Suisun Marsh. Fifth, large-scale experimentation to optimize management strategies is needed. Improved flow regimes, greater habitat diversity, and better water quality are key characteristics for achieving a healthier Delta.

In summary, ecosystem restoration in the Delta should be based on principles of landscape ecology and ecosystem management that consider content (“elements of concern”), context (larger scale patterns and processes), the history that has resulted in the current state of the ecosystem, and tradeoffs involved with reaching envisioned “healthy” states. Successful large-scale ecosystem restoration within the Delta will be dependent on restoring key patterns, processes, and environmental conditions, including (1) creating a more natural flow regime; (2) increasing and maintaining the extent, quality, diversity, and connectivity of estuarine habitats supporting native aquatic species; and (3) reducing threats and stresses to native species and habitats. Therefore, the policies and recommendations for ecosystem restoration focus on these three key requirements.

## **Policies and Recommendations**

### **Creating a More Natural Flow Regime**

Flow is a major determinant of physical habitat and biotic composition in riverine and estuarine ecosystems such as the Delta. Native aquatic species have evolved life histories in direct response to natural flow regimes. The ecological integrity of aquatic ecosystems depends on the natural dynamic character of the ecosystems in which plants and animals have evolved (Poff et al. 1997). Flow is not simply the volume of water, but also includes the timing of flow, the frequency of specific flow conditions, the duration of various flows, and the rate of change in flows. Bunn and Arthington (2002)

present four key principles showing the links between hydrology and aquatic biodiversity and the impacts of altered flow regimes. The principles are as follows: (1) flow determines physical habitat, (2) aquatic species have evolved life history strategies based on natural flow regimes, (3) upstream-downstream and lateral connectivity are essential to organism viability, and (4) invasion and success of non-native species is facilitated by flow alterations. Altered flow regimes have been shown to be a major source of degradation to aquatic ecosystems worldwide (Petts 2009).

The California State Water Resources Control Board (State Water Resources Control Board 2010) has recently presented summary determinations regarding flow criteria for the Sacramento-San Joaquin Delta ecosystem. Some key points are as follows: (1) non-flow changes like nutrient composition, channelization, habitat, invasive species, and water quality need to be addressed along with flows, (2) flow and physical habitat interact in many ways, but they are not interchangeable, (3) percent of unimpaired flow into the Delta is one pathway for setting flow criteria, (4) more natural flows are important to migratory cues of many fish species, (5) positive changes in flow or flow patterns benefit both humans and fish and wildlife, and (6) a coordinated land use policy within the Delta is needed. Creating a more natural flow regime within the Delta is an important step in meeting the coequal goal of a healthier Delta ecosystem.

### ***Flow Regime Problem***

Altered Delta flow regimes are detrimental to native aquatic species and encourage non-native aquatic species.

### ***Policies***

ER P1 Refer to WR P4.

## **Improving Habitat**

Habitat is a fundamental ecological concept that refers to the place where an organism lives. This “place” is defined by physical, chemical, and biological variables (environmental structure and processes) that provide the conditions and resources a given organism needs to survive and reproduce—“wherever an organism is provided resources that allow it to survive, that is habitat” (Hall et al. 1997). In this definition, habitat is specific to a particular organism or species, and **habitats are species-specific components of ecosystems**. Sufficiently good habitat quantity and quality is needed to allow individuals and populations to persist. The term habitat (or “habitat type”) is also often used when referring to land cover types (e.g., open water and riparian vegetation). It is, however, important to note that land cover by itself is usually not enough to determine if the covered “place” will in fact provide good-quality habitat for a specific organism. Habitat and land cover type are not the same thing (Lindenmayer et al. 2008); an organism’s habitat is much more than land cover type, just like a person’s home is much more than a house. For example, the total area of the Delta covered by open water has not substantially changed over the last few decades, but several open water (pelagic) fish species have undergone steep declines (Sommer et al. 2007), suggesting that at least some of the open water areas in the Delta have become inhospitable to these fishes—the actual habitat available to these open water species has shrunk, even though the area covered by open water has remained fairly stable. Similarly, changing land cover patterns (e.g., increasing open water areas) does not automatically lead to increases in specific target species if detrimental conditions (e.g., poor water quality or high entrainment or predation risk) make these areas unsuitable as new habitat.

As “places,” habitats are species-specific “patches” in spatially heterogeneous landscapes. These patches are separated from surrounding areas by sharp or more gradual edges (Fischer et al. 2004) and may be connected to other similar patches by “corridors.” Landscape structure (composition and configuration) affects the abundance and distribution of habitats and the organisms they support. The occurrence and

abundance of organisms is closely associated with the total amount of usable habitat in a landscape as well as with habitat patch sizes, shapes, and arrangements (e.g., Hannon and Schmiegelow 2002). Habitats that are too small, fragmented, or isolated may not support specific organisms over the long term—they are, in effect, no longer functional habitats for these organisms. Because habitats are species specific, their necessary size, shape, and arrangement in a landscape differ among species. In general, however, more, larger, and better connected patches of a specific habitat are more likely to provide the conditions for the persistence of organisms associated with that habitat (Lindenmayer et al. 2008).

Habitat loss and fragmentation due to human land use is an important driver of worldwide species losses (Foley et al 2005). In estuaries and coastal areas, overexploitation (e.g., overfishing) and habitat destruction have been identified as the leading causes of species declines and extinctions (Lotze et al. 2006). Habitat restoration can lead to species recovery, especially when carried out in combination with the reduction of other impacts such as exploitation, predation, or pollution (Lotze et al. 2006).

**Habitat in the Delta:** The Delta is continually changing, but changes over the last 160 years have been particularly rapid and dramatic (Healey et al. 2008, Moyle et al. 2010, Baxter et al. 2010). Less than 2 centuries ago, diverse and extensive estuarine landscape features ranging from open water to tidal and seasonal wetlands and forested uplands contained a multitude of habitats that supported a productive native flora and fauna adapted to the highly variable environmental conditions of the Delta. Although the present Delta continues to be a productive ecosystem, its current landscape and habitats support a much different species assemblage than the historical Delta. Many of the currently thriving species are non-native species (Cohen and Carlton 1995). They include species considered desirable (e.g., largemouth bass, a sport fish) and undesirable (e.g., the Brazilian water weed *Egeria densa*) or even harmful (e.g., the harmful cyanobacteria *Microcystis aeruginosa*) by humans. These non-native species generally evolved in different habitats with much less variable conditions (Moyle et al. 2010). In contrast, current habitat conditions are insufficient to sustain a number of aquatic and terrestrial native species such as the fishes involved in the sudden “Pelagic Organism Decline” of the 2000s (Sommer et al. 2007, Baxter et al. 2010), as well as winter- and spring-run Chinook salmon, giant garter snake, and Suisun thistle, among others (Moyle et al. 2010; Healey et al. 2008).

## **Problem Statement**

Landscape attributes and environmental conditions have changed dramatically in the Delta and the Suisun Marsh over the last 160 years. The resultant **rapid reduction in the extent, quality, and diversity of estuarine habitats supporting native aquatic species has led to declines in populations of native resident and migratory species.** Although the Delta and the Suisun Marsh remain productive parts of the San Francisco Estuary ecosystem, their unique, native natural heritage and prized ecosystem services (e.g., the provisioning of native salmon as a food source, for recreation, and as a source of cultural, intellectual and spiritual inspiration) are in danger of being irretrievably lost.

## **Policies**

ER P2 Actions that include ecosystem restoration shall be consistent with the following sections from the *Draft Ecosystem Restoration Program’s Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010):

- ϕ map and legend of Figure 4, page 35, “Land Elevations in the Delta Ecological Management Zone will largely determine what habitat types can be accommodated,” and accompanying text on pages 33-46; and
- ϕ map and legend of Figure 5, page 47, “Map of Ecological Management Units within the Delta Ecological Management Zone,” and accompanying text on pages 46-49.

The Council may incorporate revised figures from the Ecosystem Restoration Program's Conservation Strategy as it is revised.

- ER P3 Actions other than ecosystem restoration shall determine if the action would adversely impact the opportunity for ecosystem restoration at the elevations shown in Figure 4 and in the Ecological Management Units shown in Figure 5, and as explained in the accompanying text of those figures. These actions shall demonstrate that any such adverse impacts will be fully avoided or minimized. Certification of consistency associated with these actions shall consider the habitat values described generally in Section 2 of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010) and subsequent revisions of this document.
- ER P4 Protection of floodplains in the Delta and Delta watershed is critical for achieving the coequal goals, reducing flood risk, and preserving the unique character of the Delta. For actions outside the Delta, this policy is a recommendation. To be consistent with the Delta Plan:
- ϕ Actions affecting floodplains in the Delta or in the Delta watershed must demonstrate that impacts on the potential for ecosystem restoration or flood management have been fully considered and avoided or minimized.
  - ϕ Actions shall demonstrate that they would maintain or expand remaining large blocks of intact habitat or natural landscape, including floodplains, as described in the California Essential Habitat Connectivity Project (Department of Transportation and Department of Fish and Game 2010).
  - ϕ State and local agencies constructing new levees, substantially rehabilitating or reconstructing existing levees in the Delta and Delta watershed shall evaluate and incorporate alternatives (including use of setback levees) that would increase the extent of floodplain and riparian habitats.
- ER P5 New or amended local or regional land use plans shall not substantially reduce opportunities for ecosystem restoration, habitat creation, channel modification for ecosystem benefit, or increased connectivity between water and land; or direct such uses away from their most effective locations as identified in the maps, legends and accompanying text of Figures 4 and 5 of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010).

## **Recommendations**

- ER R1 The Council acknowledges the importance of expediting habitat restoration in the Delta, and recommends the prioritization and implementation of restoration projects in the following areas:
- ϕ Yolo Bypass
  - ϕ Cache Slough Complex
  - ϕ Lower San Joaquin River Floodplain
  - ϕ Suisun Marsh
  - ϕ Cosumnes River/Mokelumne River Confluence

The Council shall develop a restoration strategy and suite of specific actions for habitat restoration in the priority areas and throughout the Delta to meet the objectives defined in Water Code 85022(d) and 85302(e). Specific measures shall be incorporated

in the Delta Plan for the development of new or improved habitat, protection of existing habitat, and to facilitate the restoration of large areas of interconnected habitat within the Delta and its watershed.

ϕ

ER R2 As part of its Strategic Plan, the Delta Conservancy should:

- ϕ Develop and adopt criteria for prioritization and integration of large-scale ecosystem restoration in the Delta, with sustainability and use of best available science as foundational principles.
- ϕ Develop and adopt methods and processes for ownership and long-term operations and management of restored and/or conserved land in the Delta and Suisun Marsh.
- ϕ Recommend sources for long-term financing for programs and projects that include covering costs of long-term operations and management and “Payment in Lieu of Taxes.”
- ϕ Develop and adopt a formal mutual agreement with the Department of Water Resources, Department of Fish and Game, federal interests, and other State and local agencies on implementation of ecosystem restoration.
- ϕ Develop in conjunction with the Wildlife Conservation Board, the Department of Water Resources, Department of Fish and Game, and other State and local agencies, a plan and protocol for acquiring the land necessary to achieve ecosystem restoration consistent with the coequal goals and the *Draft Ecosystem Restoration Program’s Conservation Strategy*.

## Reducing Threats and Stresses

Ecosystem restoration cannot succeed in the face of persistent threats to the well-being of the habitats and species it seeks to restore. The current degraded habitat conditions for many native Delta species are the result of the combined impacts of multiple drivers and stressors, including physical and chemical habitat degradation, increased mortality from entrainment into water diversions and from predation, and insufficient food resources (Sommer et al. 2007, Baxter et al. 2010, Delta Independent Science Board January 2011). Expected climate change impacts (e.g., higher temperatures) will likely further degrade native species habitat in the Delta, while benefitting many non-native species. Successful recovery of native species requires aggressive habitat restoration aimed at increasing the extent, quality (including connectivity), and diversity of native species habitats, and improvement of habitat conditions through reduction of multiple threats and stresses on native species habitats. Conversely, invasive species can only be successfully controlled by the reduction of habitat conditions that favor these species over native species.

### **Problem Statement**

Habitat suitable for non-native invasive species has increased in the Delta and the Suisun Marsh, and many non-native species are now thriving. New species continue to arrive every year. **Although some key non-native species are considered desirable by humans, others are undesirable or harmful.** None of these species is part of the unique native natural heritage of the Delta and the Suisun Marsh, but some have been here for more than a century and have become an integral part of this ecosystem.

### **Policies**

ER P6 Actions shall demonstrate that the potential for new introductions of or improved habitat conditions for non-native invasive species have been fully considered and avoided or minimized in a way that appropriately protects the ecosystem.



## Recommendations

- ER R3 Pending development and adoption of an invasive species management plan for the Delta, the Department of Fish and Game should fully implement the following sections of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone (Department of Fish and Game 2010)*:
- φ List of "Potential Stage 2 Actions for Non-Native Invasive Species" on p. 54; and
  - φ Text in section "III.B. Invasives" on pages 53-58.
- ER R4 By January 1, 2013 the Delta Science Program, in conjunction with the Department of Fish and Game, the Department of Water Resources and other relevant agencies should conduct workshops with the objective of providing specific recommendations to the Council for measures to minimize stressor impacts on the Delta ecosystem and on the prioritization of such measures.

## Bay Delta Conservation Plan

The Bay Delta Conservation Plan ([BDCP](#)) is a 50-year plan being prepared through a collaboration of State, federal, and local water agencies, State and federal resource agencies, environmental organizations, and other interested parties. [The BDCP is being developed in compliance with federal and state endangered species acts to help restore fish and wildlife species and provide for the protection and restoration of water supplies while minimizing impacts to Delta communities and farms.](#) It will be incorporated into the Delta Plan if it meets the requirements of Water Code section 85320, including the approval by the Department of Fish and Game of the Bay Delta Conservation Plan as a natural community conservation plan and its approval as a habitat conservation plan pursuant to the federal Endangered Species Act. [The BDCP seeks to improve the Delta ecosystem through a comprehensive approach to addressing species needs and ecological processes. The plan will include a scientifically-based adaptive management program to ensure incorporation of new scientific information into decisions on water management and conservation measures.](#)

## Problem Statement

The Bay Delta Conservation Plan is expected to significantly ~~affected~~[advance](#) the coequal goals required by the Delta Reform Act. [BDCP proposed measures to address ecosystem restoration, water conveyance, and reduce stressors to native species would contribute to meeting the following Delta Plan recommendations: ER1, ER2, ER3 and WR R3.](#) The Bay Delta Conservation Plan [is a voluntary process that requires the approval of multiple public agencies prior to adoption.](#) The BDCP planning process has been under way since 2006, but the plan ~~will~~[may](#) not be completed prior to adoption of the Delta Plan in 2012.

## Recommendations

- ER R5 ~~The involved federal, State, and local agencies should complete the Bay Delta Conservation Plan process (i.e., receive required incidental take permits) consistent with the Delta Reform Act no later than December 31, 2014.~~ [The Council should monitor the progress of the Bay Delta Conservation Plan. Once the BDCP is finalized and if it is incorporated into the Delta Plan consistent with Water Code section 85320, the Council, Conservancy, and BDCP should coordinate on efficiently implementing adopted actions to achieve the co-equal goals. If the Bay Delta Conservation Plan process is not completed by this date consistent with the Delta Reform Act, the Council will proceed with ecosystem stressor reduction actions identified in the Delta Plan and conveyance planning recommendations independently of the Bay Delta Conservation Plan process for inclusion in the first five year update of the Delta Plan.](#)

# Performance Measures

Performance measures derive from the goals and objectives in the Act and from requirements for largescale ecosystem restoration within the Delta. The performance measures should address progress in achieving each of the following objectives in the Act:

85302(c) The Delta Plan shall include measures that promote all of the following characteristics of a healthy Delta ecosystem.

- (1) Viable populations of native resident and migratory species.
- (2) Functional corridors for migratory species.
- (3) Diverse and biologically appropriate habitats and ecosystem processes.
- (4) Reduced threats and stresses on the Delta ecosystem.
- (5) Conditions conducive to meeting or exceeding the goals in existing species recovery plans and state and federal goals with respect to doubling salmon populations.

85302(e) The following subgoals and strategies for restoring a healthy ecosystem shall be included in the Delta Plan.

- (1) Restore large areas of interconnected habitats within the Delta and its watershed by 2100
- (2) Establish migratory corridors for fish, birds, and other animals along selected Delta river channels.
- (3) Promote self-sustaining, diverse populations of native and valued species by reducing the risk of take and harm from invasive species.
- (4) Restore Delta flows and channels to support a healthy estuary and other ecosystems.
- (5) Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals.

(6) *Restore habitat necessary to avoid a net loss of migratory bird habitat and, where feasible, increase migratory bird habitat to promote viable populations of migratory birds.*

Performance measures derived from these objectives can be grouped as follows:

## Species Performance Measures:

- φ Progress toward achieving viable populations of native resident and migratory species or species groups
- φ Progress toward achieving recovery for listed species in the Delta
- φ Progress toward achieving the state and federal "doubling goal" for wild, Central Valley anadromous fishes

## Flow Performance Measures:

- φ Successful adoption of criteria for Delta inflows and outflows by January 2, 2014, and the adoption of flow criteria for the major tributary rivers to the Delta by January 2, 2018
- φ Progress toward meeting adopted Delta inflow and outflow criteria and major tributary flow criteria

## Habitat and Migratory Corridor Performance Measures:

- φ Progress toward developing new or improved aquatic and terrestrial habitat, and documented use of these habitats by key species

- φ Progress toward protecting existing habitats and documented use of these habitats by key species
- φ Progress toward restoring large areas of interconnected habitats for native resident and migratory species in the Delta and its watersheds by 2100
- φ Acres of habitat conserved for native resident and migratory species in the Delta
- φ Progress toward achieving diverse and biologically appropriate habitats and ecosystem processes
- φ Progress toward restoring habitat that is necessary to avoid a net loss of migratory bird habitat
- φ Quantity of permanent or appropriate seasonal connectivity along all major migratory routes to allow adequate migration between native fish spawning, rearing, and migration habitat
- φ Quantity of contiguous corridors for migration of fish and birds, and documented use of these corridors by key species
- φ Rates of key processes (e.g., primary production, decomposition, nutrient uptake, and respiration) in restored habitats compared to non-restored habitats

Threat and Stressor Performance Measures:

- φ Progress toward reducing numbers and proportion of native resident and migratory species (as larvae, juveniles, or adults) taken at water diversion points
- φ Progress toward decreasing annual trend in number of new, uncontrolled harmful invasive species
- φ Progress toward decreasing abundance and distribution of harmful invasive aquatic and terrestrial species
- φ Reduced concentrations of nutrients (nitrogen and phosphorus compounds) that support the growth of undesirable algae or excessive growth of nuisance aquatic plants

## References

- Baxter, R., R. Breuer, L. Brown, L. Conrad, F. Feyrer, S. Fong, K. Gehrts, L. Grimaldo, B. Herbold, P. Hrodey, A. Mueller-Solger, T. Sommer, and K. Souza. 2010. Interagency Ecological Program 2010 Pelagic Organism Decline Work Plan and Synthesis of Results. Interagency Ecological Program for the San Francisco Estuary.
- Bunn, S. E., and A. H. Arthington. 2002. Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity. *Environmental Management* 30:492-507.
- California Department of Fish and Game. 2010. Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone.
- California Department of Transportation and California Department of Fish and Game. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving and Connected California. February.
- Christensen, N. L., A. Bartuska, J. H. Brown, S. Carpenter, C. D'Antonio, R. Francis, J. F. Franklin, J. A. MacMahon, R. F. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. G. Moodmansee. 1996. The report of the Ecological Society of America Committee on the scientific basis for ecosystem management. *Ecological Applications*. 6:665-691.



- Cohen, A. N., and J. T. Carlton. 1998. Accelerating invasion rate in a highly invade estuary. *Science* 279:555-559.
- Dennison, W. C, R. J. Orth, K. A. Moore, J. C. Stevenson, V. Carter, S. Kollar, P. W. Bergstrom, and R. A. Batiuk. 1993. Assessing water quality with submersed aquatic vegetation. *BioScience* 43:86-94.
- Fischer, J., D. B. Lindenmayer, and I. Fazey. 2004. Appreciating ecological complexity: habitat contours as a conceptual landscape model. *Conservation Biology* 18:1245–1253.
- Foley, J. A., R. DeFries, G. P. Asner, C. Barford, G. Bonan, S. R. Carpenter, et al. 2005. Global consequences of land use. *Science* 309:570–574.
- Folke, C., S. Carpenter, B. Walker, M. Scheffer, T. Elmqvist, L. Gunderson, and C. S. Holling. 2004. Regime shifts, resilience, and biodiversity in ecosystem management. *Annual Reviews in Ecology Evolution and Systematics* 35:557–581.
- Foster, D., F. Swanson, J. Aber, I. Burke, N. Brokaw, D. Tilman, and A. Knapp. 2003. The importance of land-use legacies to ecology and conservation. *BioScience* 53:77–88.
- Grossinger, R. M., A. A. Whipple, J. C. Collins, and D. Rankin 2010. Historical Delta landscapes: Conceptual models for building a diverse and resilient future. Bay Delta Science Conference Abstract. Sacramento, CA.
- Grumbine, R. E. 1994. What Is Ecosystem Management? *Conservation Biology* 8:27-38.
- Hanak, E., J. Lund, A. Dinar, B. Gray, R. Howitt, J. Mount, P. Moyle, B. Thompson. 2011. Managing California's Water: From Conflict to Reconciliation. Public Policy Institute of California: San Francisco, CA.
- Hall, L. S., P.A. Krausman,. and M. L. Morrison. 1997. The habitat concept and a plea for the use of standard terminology. *Wildlife Society Bulletin* 25:173–182.
- Hannon, S. J., and F. Schmiegelow. 2002. Corridors may not improve the conservation value of small reserves for most boreal birds. *Ecological Applications* 12:1457–1468.
- Harwell, M. A., J. H. Gentile, K. W. Cummins, R. C. Highsmith, R. Hilborn, C. P. McRoy, J. Parrish, and T. Weingartner. 2010. A conceptual model of natural and anthropogenic drivers and their influence on the Prince William Sound, Alaska, ecosystem. *Human and Ecological Risk Assessment* 16:672-726.
- Healey, M. C., M. D. Dettinger, and R. B. Norgaard, eds. 2008. The State of Bay-Delta Science, 2008. CALFED Science Program: Sacramento, CA.
- Hudson, P. L., R. W. Griffiths, and T. J. Wheaton. 1992. Review of habitat classification schemes appropriate to streams, rivers, and connecting channels in the Great Lakes drainage basin. The Development of an Aquatic Habitat Classification System for Lakes. W. D. N. Busch and P. G. Sly, editors. Pp 73107. CRC Press: Ann Arbor, MI.
- Kareiva, P., et al. 2007. Domesticated nature: shaping landscapes and ecosystems for human welfare. *Science* 316:1866-1869.
- Lindemayer, D., R. Hobbs, J. Miller, et al. 2008. A checklist for ecological management of landscapes for conservation. *Ecology Letters* 11:78-91.

- Lotze, H. K., H. S. Lenihan, B. J. Bourque, R. H. Bradbury, R. G. Cooke, M. C. Kay, S. M. Kidwell, M. X. Kirby, C. H. Peterson, and J. B. C. Jackson. 2006. Depletion, degradation, and recovery potential of estuaries and coastal seas. *Science* 312:1806–1809.
- Lund, J. R., E. Hanak, W. E. Fleenor, W. A. Bennett, R. E. Howitt, J. F. Mount, and P. B. Moyle. 2010. Comparing Futures for the Sacramento-San Joaquin Delta. Freshwater Ecology Series. University of California Press: Berkeley, CA.
- Manning, A. D., J. Fischer, A. Felton, B. Newell, W. Steffen and D. B. Lindenmayer. 2009. Landscape fluidity – a unifying perspective for understanding and adapting to global change. *Journal of Biogeography* 36:193–199.
- McLeod, K. L., J. Lubchenco, S. R. Palumbi, and A. A. Rosenberg. 2005. Scientific Consensus Statement on Marine Ecosystem-Based Management. Signed by 221 academic scientists and policy experts with relevant expertise. Communication Partnership for Science and the Sea. <http://compassonline.org/?q=EBM>.
- Moyle, P. B., W. A. Bennett, W. E. Fleenor, and J. R. Lund. 2010. Habitat variability and complexity in the upper San Francisco Estuary. *San Francisco Estuary and Watershed Science*. Volume 8, Issue 3.
- Osborne, L. L., and D. A. Kovacic. 1993. Riparian vegetated buffer strips in water-quality restoration and stream management. *Freshwater Biology* 29:243-258.
- Palmer, M. A., E. S. Bernhardt, J. D. Allan, P. S. Lake, G. Alexander, S. Brooks, J. Carr, S. Clayton, C. N. Dahm, J. Follstad Shah, D. L. Galat, S. Gloss, P. Goodwin, D. H. Hart, B. Hassett, R. Jenkinson, G. M. Kondolf, R. Lave, J. L. Meyer, T. K. O'Donnell, L. Pagano, P. Srivastava, and E. Sudduth. 2005. Standards for ecologically successful river restoration. *Journal of Applied Ecology* 42:208217.
- Petts, G. E. 2009. Instream flow science for sustainable river management. *Journal of the American Water Resources Association* 45:1071-1086.
- Poff, N. L., J. D. Allan, M. B. Bain, J. R. Karr, K. L. Prestegard, B. D. Richter, R. E. Sparks, and J. C. Stromberg. 1997. The natural flow regime. *BioScience* 47:769-784.
- Sommer, T., C. Armor, R. Baxter, R. Breuer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W. Kimmerer, A. Mueller-Solger, M. Nobriga, and K. Souza. The collapse of pelagic fishes in the Upper San Francisco Estuary. *Fisheries* 32:270-277.
- State Water Resources Control Board. 2010. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem. California Environmental Protection Agency, Sacramento, CA.
- Swetnam, T. W., C. D. Allen, and J. L. Betancourt. 1999. Applied historical ecology: Using the past to manage for the future. *Ecological Applications* 9:1189-1206.
- Szaro, R., W. T. Sexton, and C. R. Malone. 1998. The emergence of ecosystem management as a tool for meeting people's needs and sustaining ecosystems. *Landscape and Urban Planning* 40:1-7.
- Whipple, A. A., R. M. Grossinger, J. C. Collins, and D. Rankin. 2010. The historical Yolo Basin landscape: What parts make the whole? Bay Delta Science Conference Abstract. Sacramento, CA.
- Whipple, A. A. 2011. [http://www.afs-calneva.org/\\_files/Cal-Neva\\_AFS\\_Conf\\_2011\\_Abstracts.pdf](http://www.afs-calneva.org/_files/Cal-Neva_AFS_Conf_2011_Abstracts.pdf).



AGENDA ITEM 7  
APPENDIX A  
THIRD STAFF DRAFT DELTA PLAN

# **Chapter 7**

## **Reduce Risk to People, Property, and State Interests in the Delta**

Water Code sections 85305, 85306, 85307, and 85309 require the Delta Plan to include specific objectives.

85305. *(a) The Delta Plan shall attempt to reduce risks to people, property, and state interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments.*

*(b) The council may incorporate into the Delta Plan the emergency preparedness and response strategies for the Delta developed by the California Emergency Management Agency pursuant to Section 12994.5.*

85306. *The council, in consultation with the Central Valley Flood Protection Board, shall recommend in the Delta Plan priorities for state investments in levee operation, maintenance, and improvements in the Delta, including both levees that are a part of the State Plan of Flood Control and non-project levees.*

85307. *(a) The Delta Plan may identify actions to be taken outside of the Delta, if those actions are determined to significantly reduce flood risks in the Delta.*

*(b) The Delta Plan may include local plans of flood protection.*

*(c) The council, in consultation with the Department of Transportation, may address in the Delta Plan the effects of climate change and sea level rise on the three state highways that cross the Delta.*

*(d) The council, in consultation with the State Energy Resources Conservation and Development Commission and the Public Utilities Commission, may incorporate into the Delta Plan additional actions to address the needs of Delta energy development, energy storage, and energy transmission and distribution.*

Based upon Water Code Section 85309, the Council shall consider a proposal from the Department of Water Resources, in consultation with the Corps of Engineers and the Central Valley Flood Protection Board, to coordinate flood and water supply operations of the State Water Project and the federal Central Valley Project.

# Chapter 7

## Reduce Risk to People, Property, and State Interests in the Delta

### Introduction

The Delta is an inherently flood-prone area at the confluence of two massive watersheds. The watersheds of the Sacramento and San Joaquin Rivers collectively drain approximately 43,000 square miles. What was historically a tidal marsh formed through the interaction of fluctuating sea levels and an influx of alluvial sediments from river floods has been transformed. It is now a complex labyrinth of reclaimed islands and waterways created through the construction of levees, many of which were constructed over the past 150 years using light equipment and local, uncompacted sediments and organic matter, and with little or no foundation preparation.

The Delta (the legal Delta and Suisun Marsh) includes more than 1,335 miles of levees that protect approximately 839,610 acres of land. These levees face potential threats such as large runoff events, earthquakes, extreme high tides, wind-generated waves, subsidence, and sea level rise. Individually, each of these threats is enough to cause serious concern; together, they represent a potential for catastrophic disruption of the Delta. A mass failure of the levee system would have real life-and-death impacts, and property losses that could total billions of dollars. Levee failures not only create direct damage and potential loss of life from flooding, but also change the configuration of the Delta—both water and land—and alter the mixing of fresh water with salt water. A failure could also have significant effects on California's economy from interruption of service to 25 million urban water users and to approximately 3 million acres of irrigated farmland that depend, in part, on water conveyed through the Delta.

The portfolio of [economically and ecologically based](#) risk-reduction strategies must consider urban and rural communities as well as agricultural lands in the process of identifying evaluating, and prioritizing investments in the levee system. Risks can be reduced through an emergency preparedness, response, and recovery system; appropriate land uses; [land acquisition and conversion to ecosystem functions](#); [subsidence reversal strategies](#); and strategic levee improvements.

Flood risk is assessed in terms of the likelihood of a flood event occurring, the chance of failure from that flood event, and the associated consequences. Consequences can entail loss of life and economic and environmental damage. Risk of flooding in the Delta is likely to increase over time as a result of several factors: continued development within the floodplains, inadequate levees, inadequate channel capacities, seismic vulnerability, continuing subsidence, climate change, and sea level rise. It is estimated that by the year 2100, sea level rise may reach 55 inches (California Climate Action Team 2010, California Ocean Protection Council 2011). Failure of significant parts of the Delta's [current](#) flood management system will be unavoidable. [Given that failures will occur, decisions regarding the prioritization of all future risk reduction measures and costs must be made on the basis of economically, socially and ecologically](#)

justified analyses. Wise public policy calls for the matching of sustainable land uses to levee standards or other risk reduction measures based upon sound economic, social and ecosystem justifications.

Flood risk reduction cannot absolutely prevent harmful inundation from floods, but can reduce its likelihood and social and economic impacts. History has shown that unavoidable structural failures in the system will occur as a result of extraordinary events, imperfect knowledge, and imperfect materials. Risks must be well understood, and then managed and controlled to the extent possible through public awareness, adequate emergency management planning, and enforcement of existing flood management regulations. Many studies and efforts addressing flood management and emergency preparedness, response, and mitigation are underway, and will be considered by the Council for ongoing Delta flood risk management. These studies include the Central Valley Flood Protection Plan, FloodSAFE, and the U.S. Army Corps of Engineers Delta Islands Levees Feasibility Study, the Long Term Management Strategy for Dredging, periodic inspection system, and levee safety action classification system. Once the critical economic, social and ecosystem justifications have been made, the Delta Plan will consider the findings of these studies to guide the Council in implementing its policies and making determinations of consistency. Furthermore, new efforts are needed to match long-term Delta ecosystem plans with economically based risk reduction actions.

This chapter presents economically based risk-reduction policies and recommendations necessary for the achievement of the coequal goals.

## Floodplain and Floodway Protection

Adequate flood flow capacity is critical for managing flood risks to upstream, adjacent, and downstream land uses, and for overall Delta water management and ecosystem integrity. Both the Federal Emergency Management Agency (FEMA) and the State Central Valley Flood Protection Board play a role in designating floodways to accommodate flood flows. “Designated Floodway” refers to the channel of the stream and that portion of the adjoining floodplain reasonably required to provide for the passage of a design flood; it is also the floodway between existing levees as adopted by the Central Valley Flood Protection Board or the Legislature.

The State Central Valley Flood Protection Board, under Section 8609 of the Water Code, has the authority to designate floodways in the Central Valley. Title 23 of California Code of Regulations provides further details of the Board’s regulatory authority; specifically, Article 5, Section 107, regulates land uses in Designated Floodways. Under the National Flood Insurance Program, FEMA establishes regulatory floodways, and participating communities are expected to regulate development within their floodways in accordance with the regulations defined primarily by federal regulations.<sup>1</sup>

Despite these regulations, land use policies guiding development in floodways are not consistent across Delta counties. Additionally, floodways have not been established for many of the channels within the Delta by either FEMA or the State Central Valley Flood Protection Board. In light of these problems, the Delta Plan should address these issues and highlight the need for policies and recommendations that accommodate floodplain and floodway protection. Concerns that floodways may expand and deepen as a consequence of sea level rise and changes to rainfall and snow patterns over the next 100 years must be

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<sup>1</sup> 44 Code of Federal Regulations 60.3(b)(6,7,10) requires the following:

- *Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Administrator;*
- *Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;*
- *Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community’s Flood Insurance Rate Map (FIRM), unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.*



addressed and accommodated. Development in existing or future floodplain or bypass locations in the Delta or upstream can permanently eliminate the availability of these areas for future floodplain usage.

### **Problem Statement**

Structures constructed in the floodway that encroach on existing floodplains and potential future floodplain or bypass locations in the Delta and upstream could reduce the flood carrying capacity of the Delta.

### **Policies**

RR P1 Refer to ER P4.

RR P2 Existing or potential value of floodways<sup>2</sup> or potential floodways shall not be encroached<sup>3</sup> upon nor diminished without mitigating for potential or future flood flows, except as provided in this Delta Plan.

RR P3 Existing or potential value of floodplains<sup>4</sup> or potential floodplains shall not be encroached upon nor diminished except as provided in this Delta Plan. The following areas are identified in the Delta Plan as potential floodplains and should also provide ecosystem benefit:

- φ Areas located in the Yolo Bypass from Fremont Weir through Cache Slough to the Sacramento River outside of the existing floodplain easement, including the confluence of Putah Creek into the bypass;
- φ The Cosumnes River/Mokelumne River confluence, as defined by the North Delta Flood Control and Ecosystem Restoration Project (Department of Water Resources 2010);
- φ The San Joaquin River/South Delta Floodplain. This area extends north from the southern boundary of the legal Delta, including all of Pescadero Tract, Paradise Cut and Reclamation Districts R-2075, R-2064, R-2085, R-2094, R-2095, the portion of R-1007 generally north of Bethany Road and the portion of R-2058 north of Interstate 205, and the undeveloped portion of Stewart Tract. This area will be modified upon completion of studies by the Department of Water Resources that will define the floodplain as referenced in Water Code section 9613(c).

### **Recommendation**

RR R1 The Legislature should fund and the Department of Water Resources and the Central Valley Flood Protection Board should complete their investigation of the bypass and floodways in the San Joaquin River to reduce potential flooding near Paradise Cut, as required by Water Code section 9613(c).

RR R2 The current efforts led by the U.S. Army Corp of Engineers—the *San Francisco Bay Long Term Management Strategy for Dredging and the Delta Dredged Sediment Long-Term Management Strategy*—should be continued and supported so that desirable dredging to support the Delta Plan and the coequal goals, might be achieved. Appropriate dredging might

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<sup>2</sup> As defined by California Code of Regulations, Title 23, Division 1, Chapter 1, Article 2, Section 4: (n) Floodway. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that convey flood waters.

<sup>3</sup> As defined by California Code of Regulations, Title 23, Division 1, Chapter 1, Article 2, Section 4: (m) Encroachment. "Encroachment" means any obstruction or physical intrusion by construction of works or devices, planting or removal of vegetation, or by whatever means for any purpose, into any of the following: (1) any flood control project works; (2) the waterway area of the project; (3) the area covered by an adopted plan of flood control; or (4) any area outside the above limits, if the encroachment could affect any of the above.

<sup>4</sup> As defined by the FEMA National Flood Insurance Program: *Floodplain: Any land area susceptible to being inundated by flood waters from any source.* <http://www.fema.gov/business/nfip/19def2.shtm>.

increase flood conveyance while at the same time acquiring material which might be used for levee maintenance (U.S. Army Corps of Engineers 2002).

## Delta Levee Design Criteria

The 1992 Delta Protection Act designated the Delta as a flood-prone area and defined the most appropriate land uses as agriculture, wildlife habitat, and where specifically provided, recreation (Public Resources Code section 29704). Although levees were constructed in the Delta to reduce the risk of flooding, the historical performance of many levees in the Delta is poor. Many levee failures have been attributed to high flood flows, and some levees have failed in the absence of any type of flood. If a significant earthquake does occur on faults near the western Delta, one or more levees could fail or subside (Department of Water Resources 2009). With this in mind, it is more important than ever that the levees in the Delta are designed, constructed, and maintained to provide the level of flood risk reduction commensurate with the ~~land and~~ economic and ecological resource uses they protect on an island by island basis.

As discussed in Delta Vision, the level of flood protection provided by levee classifications should be related to an acceptable risk for the types of land use located behind the levee (Delta Vision Blue Ribbon Task Force 2008). A classification system is needed that aligns levee design with corresponding appropriate land and resource uses, ranging from habitat or ecosystem protection up to protection of large urban areas comprising thousands of people and homes. During the last few decades, state and federal agencies have developed various levee standards. These standards were designed to either establish minimum criteria that would make the levees and the properties protected eligible for grants or rehabilitation funds, or minimum criteria that would allow development behind the levees. While there is a significant history associated with these standards, none are economically based nor do they consider the ecological goals for tidal marsh restoration. Hence, new standards need to be developed expeditiously by the Federal and State agencies. Currently, ~~the~~ the four most prominent existing island levee standards are listed below:

- φ **FEMA Hazard Mitigation Plan:** Meeting this standard allows the Delta island or tract to be eligible for FEMA disaster grants and assistance following levee failures and island inundation.
- φ **USACE Public Law 84-99:** Meeting this standard allows the Delta island or tract to be eligible for USACE funding for levee rehabilitation and island restoration following levee failures and island inundation, provided the reclamation district applies for and is accepted into the program and passes a rigorous initial inspection and periodic follow-up inspections. Both of the above two standards are based primarily on levee geometry with minimum freeboard and maximum steepness of slopes. Although the geometry implies a minimum slope stability factor of safety, neither standard is associated with a level of protection and neither addresses seismic stability.
- φ **FEMA 100-year (Base Flood) Protection:** This standard, often called the 1 percent annual chance flood level of protection, is based on criteria established in the Code of Federal Regulations and is often used with established USACE criteria to meet certain freeboard, slope stability, seepage/underseepage, erosion, and settlement requirements. Meeting this level of flood protection means that communities will not require mandatory purchase of flood insurance or be subject to building restrictions. This standard generally does not address seismic stability. Very few levees in the central Delta meet this standard.
- φ **DWR 200-year Urban Levee Protection:** This standard is similar to the FEMA standard, but for a 200-year level of flood protection. It is generally based on established USACE criteria. However, unlike USACE criteria, the DWR 200-year Urban Levee Protection requires that seismic stability be addressed. Not meeting this standard, or making adequate progress toward it, will generally prohibit further development behind an urban or urbanizing levee. Although almost

none of the levees in the central Delta meets this standard, most do not protect urban areas, with the exceptions of the outer fringes of the Delta near West Sacramento, Sacramento's Pocket Area, and Stockton.

It is likely more useful to properly align [economic land](#) and resource uses with specific [island](#) levee design criteria. This can help ensure that land and resource uses realize appropriate flood risk protection, but also signal that future alterations and changes to land and resource uses must remain in alignment with appropriate [ecosystem goals, economic sustainability and risk reduction-levee design](#) criteria. To that end, this section provides policies that address the alignment of land and resource uses with appropriate levee design criteria.

While most of the attention is typically directed toward flood risk reduction for life and property, [future efforts must be based upon economically based risk reduction measures which consider future drivers of change and flood protection is also a consideration for habitat](#) and ecosystem values and goals. Among other considerations, setback levees that expand flood conveyance capacity and reduce flood risk while providing ecosystem restoration and recreational opportunities are worthwhile (U.S. Army Corps of Engineers 2002).

### Problem Statement

[The status of many Delta levees condition to meet economic, social and ecological public needs cannot be assessed until further analyses are completed and a new levee classification system is established. are not adequately designed and/or maintained to protect the existing land and resource uses.](#)

### Policies

RR P4 [Once a new levee classification system has been established, A](#)ctions occurring after January 1, 2015 shall conform to the classifications defined in Table 71. Actions protected by Class 5 levees must conform by 2025 in accordance with the Central Valley Flood Protection Act of 2008 (Government Code section 65865.5(a)(3)).

**Table 7-1**  
**Levee Classifications for Land and Resource Uses**

Levee System Goals							Minimum Design Criteria
Levee System Classification	Description	Land Use					
		Wetlands/ Habitat	Agricultural	Infrastructure	Rural Residential Uses with less than 10,000 people <sup>c</sup>	Urban Residential Uses with more than 10,000 people <sup>c</sup>	
Class 1	No specific goal <sup>a</sup>	✓	NA	NA	NA	NA	Designed to manage the flood risk to the level appropriate for individual ecosystem restoration projects.
Class 2 <sup>b</sup>	HMP	✓	✓	NA	NA	NA	Current DWR nonurban levee design criteria.
Class 3	PL84-99	✓	✓	✓	NA	NA	Current DWR nonurban levee design criteria.
Class 4	FEMA – 100-year	✓	✓	✓	✓ <sup>d</sup>	NA <sup>d</sup>	Current DWR nonurban levee design criteria, and must be accredited by FEMA as providing protection from the 100-year flood event.

**Table 7-1**

**Levee Classifications for Land and Resource Uses**

Levee System Goals						Minimum Design Criteria
Levee System Classification	Description	Land Use				
		Wetlands/ Habitat	Agricultural	Infrastructure	Rural Residential Uses with less than 10,000 people <sup>c</sup>	Urban Residential Uses with more than 10,000 people <sup>c</sup>
<b>Class 5</b>	DWR – 200-year <sup>e</sup>	✓	✓	✓	✓ <sup>d</sup>	✓ <sup>d</sup>
Current DWR urban levee design criteria for the 200–year flood event. and must be accredited by FEMA as providing protection from the 100-year flood event						

Notes:

NA: Denotes Not Acceptable

✓: Denotes Acceptable

HMP: Hazard Mitigation Plan. FEMA geometrical levee criteria.

PL84-99: Public Law 84-99 standards developed by the US Army Corps of Engineers.

FEMA-100-year: Levees accredited by FEMA as providing 100 year flood protection.

<sup>a</sup> Class 1 levees are designed to serve the need of the habitat, and may be allowed to periodically fail.

<sup>b</sup> Islands where Class 2 levees are appropriate include those, after adequate consideration, that are judged to have no specific Statewide interest and may not be reclaimed after a levee failure.

<sup>c</sup> Levee protection for legacy towns should be determined based on site specific needs (e.g., floodwalls) and financing available.

<sup>d</sup> Levees for areas with residential, commercial, and industrial businesses should comply with requirements contained in the Natural Resources Agency "Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento-San Joaquin Valley," and ultimately upgrade to at least Class 5 (Federal Emergency Management Agency 200-year).

<sup>e</sup> In accordance with the Central Valley Flood Protection Act of 2008 (Senate Bill 5, Machado)

**RR P5** Until the Department of Water Resources adopts criteria to define locations for future setback levees, any action located next to the land side of a levee shall demonstrate adequate area is provided to accommodate setback levees, as determined by a registered civil engineer or geologist.

## Flood Management Investment

The Delta is inherently flood-prone, but its levees protect its residents, its agricultural land, and energy, communications, and transportation facilities vital to the economic health of California (Public Resources Code section 32301(h)). Levee maintenance and improvements in the Delta are critical for reducing risks to acceptable levels. Depending on the ownership of the levee, the responsibilities for these activities—and the financial investment required—are assigned to state agencies and/or local landowners and reclamation districts.

Although many major levees are Project levees and managed by state agencies, 65 percent of the levees in the Delta are non-Project local levees. These levees are not part of the federal flood-control program and are maintained by local agencies (primarily reclamation districts) that are partially reimbursed by the State. It is difficult for local agencies to raise funds for the local share of state and federal assistance programs. Also, few Delta properties have federal or private flood insurance, and as a result, these uninsured property owners may be solely responsible for repairs and losses following a levee failure.

Although the State has expended ~~tens-hundreds~~ of millions of dollars since ~~2000-1988~~ on Delta levee operation, maintenance, and improvement, significant funding would still be needed to raise all Delta levees to PL84-99 standards. Given the potential threats faced by Delta levees, risk must be reduced through a set of management policies that prioritize strategic and focused investments of resources into levees economically based risk reduction actions in a manner that best balances the multitude of uses in the Delta. The State Council, in consultation with the Central Valley Flood Protection Board, is required to promote effective strategic levee investments and recommend prioritization of State investments (Water Code section 85305(a), 85306).

## **Problem Statement**

There is no clear state policy for ~~flood management~~ long-term sustainable risk reduction and state funding within the Delta. Priorities need to be set for state-funded ~~flood management~~ sustainable risk reduction investments.

## **Policies**

RR P6 In consultation with the Central Valley Flood Protection Board, the Council shall develop a strategic risk reduction investment plan that will identify potential improvements with the greatest public benefits, is economically and ecologically sustainable, and contributes to the achievement of the co-equal goals. The strategic investment plan shall~~An action utilizing State investments for levee improvements in the Delta shall:~~

- φ Reduce risk of loss of life.
- φ Not result in an increase in the number of people at risk.
- φ Recognize the wide variability of conditions across the Delta, including: depth of inundation upon failure; current height and condition of existing levees; degree of exposure to seismicity, sea level rise, climate change, and river flood levels; the ability of land uses to recover from short or long-term inundation, and the consequences to water quality, critical utilities and transportation corridors.
- φ Evaluate investment in alternative ~~flood management~~ risk reduction strategies, comparing levee upgrade to flood-proofing, acquisition and conversion to habitat; subsidence reversal; relocation of infrastructure, and flood insurance.
- φ Evaluate long-term drivers of change and economic sustainability before establishing funding priorities
- φ Integrate risk reduction investments with the co-equal goals through the coordinated evolution of some islands to habitat.

## **Emergency Preparedness and Response**

Emergency preparedness is the first line of flood defense. It is imperative that federal, State, and local governments—the citizens themselves—be prepared for a variety of emergency situations. Emergency response should be routinely tested and practiced (Delta Vision Blue Ribbon Task Force 2008).

To effectively and reliably reduce risks to people, property, and state interests in the Delta, a multifaceted strategy of coordinated emergency preparedness, appropriate land use planning, and prioritized investment in ~~flood protection~~ risk reduction infrastructure is necessary and prudent. Delta levees not only protect life and personal property, but ~~also a few select levees~~ play a large role in protecting vital infrastructure, including the State's water conveyance system. Despite the risks of levee failure, no published emergency action plan exists that addresses the consequences to federal and State water supply

deliveries of catastrophic levee failure in the Delta. Although investment in flood-protection risk reduction measures and infrastructure can considerably reduce the likelihood of a-catastrophic losses levee failure, failures are inevitable and will require the implementation of well-coordinated and carefully developed emergency response planning efforts. To reduce response time while optimizing the effectiveness of the response effort, such plans will need to harness the unique capabilities of each agency with a mission in the Delta.

Despite the vital importance of adequate preparation, no updated Delta-wide emergency response plans currently under development need to be published-exists. The California Emergency Management Agency, Department of Water Resources, and several local agencies are preparing individual emergency response plans for the Delta, but the development of these should be coordinated, tested, and practiced. Strategies being prepared as directed by SB27 will address this issue, and will be considered in the Delta Plan.

### **Problem Statement**

Levee failures and flooding can and will place human life and property in danger, and On a long-term basis, certain specific levee breaches which are left open to the tides can also have potentially significant implications for the State's water supply and may help the health of the Delta ecosystem. Current land use activities which exacerbate land subsidence and increase the forces on levees further increase the probability and damages associated with levee failure.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

RR R3 The following actions should be taken to promote emergency preparedness in the Delta:

- φ The Department of Water Resources and local flood management agencies should prepare and regularly update *Delta Multi-Hazard Coordination Plans and Inland Mass Evacuation Plans*; and participate in "Golden Guardian"-like emergency response exercises, Inland Mass Evacuation exercises, and emergency preparedness public training, notification, and outreach programs.
- φ The Department of Water Resources should complete their Delta Flood Emergency Preparedness, Response and Recovery Program addressing a wide range of emergency response strategies, being undertaken in coordination with the Corps of Engineers Delta Emergency Operations Plan, local emergency operations plans and water stakeholders. The Program would improve response and recovery time for impacts to life, property, critical infrastructure and environment in the Delta, and water supply interests reliant on the Delta.
- φ The Department should coordinate with state and federal agencies and water interests reliant on the Delta to implement an emergency freshwater pathway to export facilities considering unique needs and priorities in the event of a catastrophic multi-island failure.
- φ• In consultation with local agencies, the Department of Water Resources should expand their emergency stockpiles for repair of levee breaches and seismically-induced levee slumping in response to catastrophic levee failures, and to make them regional in nature and usable by a larger number of agencies. The Department, as a part of this plan, should evaluate the potential of creating stored material sites by "over reinforcing" western delta levees.



- φ State and local agencies and regulated utilities that own and/or operate infrastructure within the Delta should prepare emergency response plans to protect the infrastructure from longterm outages resulting from failures of the Delta levees. The emergency procedures should consider methods that also would protect Delta land use and ecosystem.
- φ Responsible Emergency Management Authorities should consider and implement the recommendations of the Delta Multi-Hazard Coordination Task Force (Water Code section 12994.5).

## Limitation of Liability

The U.S. Army Corps of Engineers and other federal agencies are afforded immunity from liability of any kind for damages arising from flood events through the provisions of the Flood Control Act of 1928. However, this immunity is not enjoyed by parties outside of the federal government.

The most notable recent court decision on flood liability was the November 2003 *Paterno vs. State of California* decision. The California Court of Appeals found the State liable, by inverse condemnation, for damages incurred by flooded residents as a result of failure of a Yuba River levee that the State did not design, build, or even directly maintain. This decision makes it possible that the State will ultimately be held responsible for the structural integrity of much of the federal flood-control system in the Central Valley—approximately 1,600 miles of State-Federal project levees that protect more than half a million people and property exceeding \$50 billion in value.

In another California court case, *Arreola vs. Monterey County*, local agencies were held liable in July 2002 for 1995 flood damages to property owners that resulted from a failure to properly maintain the Pajaro River project.

## Problem Statement

As the risks of levee failure and corresponding damage increase, California's courts have generally exposed public agencies, and the State specifically, to significant financial liability for flood damages (California Department of Water Resources 2005).

## Policies

At this time, there are no policies with regulatory effect included in this section.

## Recommendations

- RR R4 The Legislature should provide specific immunity for public safety flood protection activities, similar to that provided for police and correctional activities (Government Code section 844), and fire protection activities (Government Code section 850).
- RR R5 The Legislature should require an adequate level of flood insurance for individuals, businesses, and industries in floodprone areas.

## Financing of Local Flood Management Activities

No regional authority exists to facilitate the assessment and disbursement of funds for Delta [risk reduction measures](#), levee operations, maintenance, and improvements, or to collect and provide timely data and reporting on levee conditions. Such an authority could act to consolidate activities relating to [subsidence control](#), levees conditions assessment, data collection efforts, emergency preparedness notification, and fee authority. This could provide for a more [centralized-progressive](#) and responsive entity [managed-on-a-local-basis](#) for Delta interests [and long-term sustainability](#).

## Problem Statement

~~Financing~~ The economic justification to support the continued public funding of all local levee operations, maintenance, and ~~related data collection efforts is not well coordinated~~ improvements has not yet been conducted. Once economically based risk reduction priorities are established, a coordinated plan and effort to achieve a reduction in losses needs to be developed.

## Policies

At this time, there are no policies with regulatory effect included in this section.

## Recommendations

RR R6 A Delta Flood Management Assessment District should be created with fee assessment authority (including over state infrastructure) to provide ~~adequate flood control protection~~ economically based risk reduction measures and emergency response for the local and regional benefit of participants within the Delta.

This district should be authorized to:

- φ Develop, fund, and implement a regional plan of economically based risk reduction ~~flood management~~ for ~~both Project and nonProject levees of~~ the Delta in cooperation with the existing reclamation districts, cities, counties, and owners of infrastructure protected by the levees;
- φ Survey levees and report survey and conditions data to the Department of Water Resources at least every 5 years;
- φ Perform a beneficiary pay analysis for on-going anthropogenic changes which are increasing flood risk;
- φ In coordination with the Department of Water Resources and Corp of Engineers, establish standardized flood risk measurement data. This data should support the development of Expected Annual Damage values for the Delta. Expected Annual Damage is a measure of risk that integrates the likelihood and consequences of flooding, and is also the standard measure of the benefits of reducing flood risk; Expected Annual Damage estimates will include a comparative analyses of losses from on-going subsidence, water quality degradation and foregone ecosystem opportunities associated with maintaining the existing plan form versus a more economically sustainable form.
- φ Notify residents and landowners of flood risk on an annual basis;
- φ Develop emergency procedures including but not limited to evacuation.

Note that the Council is recommending in the Finance Plan (FP R4) that the proposed agency be given funding ~~(up to \$110 ?? million)~~ to develop and implement a strategic risk reduction investment plan that will identify potential improvements with the greatest public benefits, is economically and ecologically sustainable, and contributes to the achievement of the co-equal goals. the regional plan.

## Subsidence Reduction and Reversal

Much of the central Delta lands are composed of peaty soils that exist naturally as fibrous, low-density, compressible soils usually in a saturated state. To grow crops in such soils, farmers constructed levees and dikes around the tracts and drained the fields. Drying saturated peat reduces its volume by 50 percent. Early cultivation practices included burning, which further reduced the volume and altered the structure. Over time, long-term oxidation chemically reduced the peaty soils to small particles and gases that blew



away gradually. Today, much of the central Delta is below sea level, with some islands commonly 12 to 15 feet [and as much as 30 feet](#) below sea level, requiring levees that are 20 to 25-feet high [or higher](#) to hold back water every day. However, some recent practices that can reverse subsidence have been investigated. The State is participating in subsidence reversal pilot studies on Sherman and Twitchell islands and other areas.

### ***Problem Statement***

Agricultural practices have promoted deep subsidence over the last 150 years. Although subsidence has slowed or halted in many areas, some regions of the Delta [and Suisun Marsh](#) continue to subside [causing a significant increase in risks and damages to public interests. The costs associated with either historic or current subsidence have been born substantially by the general public and not by the local beneficiaries.](#)

### ***Policies***

At this time, there are no policies with regulatory effect included in this section.

### ***Recommendations***

RR R7 State agencies should not renew or enter into agricultural leases on western Delta islands that promote or contribute to subsidence on the leased land unless the lessee participates in subsidence-reversal or reduction programs.

φ [Perform a beneficiary pay analysis for on-going anthropogenic changes which are increasing economic and ecological risks;](#)

## **Reoperation of Upstream Reservoirs and Peak Flow Attenuation to Improve Flood Management**

The federal and State agencies have initiated evaluations to modify flood control management procedures on an individual stream basis but have not completed a comprehensive Delta watershed analysis. How reservoirs upstream of the Delta are operated can have substantial impacts on flood flows through the Delta; therefore, operations procedures among the responsible authorities should be well coordinated.

### ***Problem Statement***

Flood and water supply operations are not well coordinated between State and federal entities.

### ***Policies***

At this time, there are no policies with regulatory effect included in this section.

### ***Recommendations***

RR R8 U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and Department of Water Resources should modify flood control management procedures for reservoirs upstream of the Delta considering sea level rise, changes in precipitation, and changes in water supply operations.

## **Performance Measures**

φ Percentage of Delta levees that comply with the protection classifications shown in Table 7-1 based on land and resource uses.

- φ Percentage of residential and commercial structures covered by flood insurance in the Delta.
- φ Decrease in Delta area flood risk over time as measured by Expected Annual Damage.
- φ The development of written emergency preparedness and response plans and the frequency of emergency preparedness drills.
- φ Percentage of floodplains or floodways defined and regulated to protect flood capacity.

## References

- California Climate Action Team. 2010. State of California Sea-Level Rise Interim Guidance Document. Developed by the Sea-Level Rise Task Force of the Coastal and Ocean Working Group, with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. October.
- California Ocean Protection Council. 2011. Resolution of the California Ocean Protection Council on Sea- Level Rise. Adopted March 11.
- Delta Vision Blue Ribbon Task Force. 2008. Delta Vision Strategic Plan. Sacramento, CA. October.
- Department of Water Resources. 2005. "Flood Warnings: Responding to California's Flood Crisis." White Paper. [http://www.water.ca.gov/pubs/flood/flood\\_warnings\\_\\_\\_responding\\_to\\_california's\\_flood\\_crisis/011005floodwarnings.pdf](http://www.water.ca.gov/pubs/flood/flood_warnings___responding_to_california's_flood_crisis/011005floodwarnings.pdf).
- Department of Water Resources. 2009. Delta Risk Management Strategy Final Phase 1 Report. March.
- Department of Water Resources. 2010. North Delta Flood Control and Ecosystem Restoration Project Final Environmental Impact Report. Sacramento, CA. October.
- U.S. Army Corps of Engineers. 2002. Sacramento and San Joaquin River Basins California Comprehensive Study, Interim Report. Sacramento District.

AGENDA ITEM 7  
APPENDIX A  
THIRD STAFF DRAFT DELTA PLAN

**From:** Jason Peltier

**Sent:** Saturday, June 11, 2011 6:55 AM

**To:** joe.findaro@akerman.com; 'Ed Manning'; 'Tony Coelho'; 'David Bernhardt'; 'Tom Birmingham'; 'Bill Kahrl'; 'Carolyn Jensen'

**Subject:** Re-mapping clips

**District maps draw a new political landscape** -- California's new voting districts could put Democrats within reach of as many as five more seats in Congress and enough in the state Legislature for the two-thirds majority needed to raise taxes, according to Democratic and Republican analysts. **EVAN HALPER** and **RICHARD SIMON** in the [Los Angeles Times](#) -- 6/11/11

**California Legislature may see more swing districts under draft political maps** -- California's intensely partisan political system could see more swing districts, new faces and the most significant shake-up in decades under draft legislative and congressional maps released Friday by the state's redistricting commission. **JIM SANDERS** and **PARESH DAVE** in the [Sacramento Bee](#) -- 6/11/11

**New state political maps propose more Inland seats** -- Inland Southern California would pick up two new congressional seats, a Senate district and several Assembly seats in draft plans released Friday by the independent panel in charge of redrawing the state's political landscape. **JIM MILLER, BEN GOAD** and **DUANE W. GANG** in the [Riverside Press](#) -- 6/11/11

**Release of new maps creates political 'tsunami'** -- Some incumbents called their new proposed districts "baffling." Latino leaders called the maps a disaster. But political reformers characterized them as a vast improvement from the old, party-driven system. **LISA VORDERBRUEGGEN** and **TRACEY KAPLAN** in the [San Jose Mercury](#) -- 6/11/11

**Political earthquake roils California delegation** -- A redistricting panel has demolished California's exquisitely gerrymandered congressional map, ushering in the prospect of a massive turnover in the state's delegation and imperiling the careers of some of Capitol Hill's most powerful pols. **ALEX ISENSTADT** [Politico](#) -- 6/11/11

**Draft California congressional maps promise more competition** -- Colleagues become competitors and political hometowns get unsettled under a proposed new congressional district map unveiled Friday. **MICHAEL DOYLE** in the [Sacramento Bee](#) -- 6/11/11

**New draft redistricting map hurts Rep. Sanchez** -- While the maps don't dismantle Sanchez's Democratic Latino district as radically as did an initial rough draft, they would diminish Democrats' advantage in voter registration for the central county seat. **MARTIN WISCKOL** in the [Orange County Register](#) -- 6/11/11

**Redistricting by Citizens Has Test in California** -- While other states have experimented with ways to minimize the political horse-trading — and retribution — that have become part and parcel of redistricting, not one has gone quite as far as California. **ADAM NAGOURNEY** in the [New York Times](#) -- 6/11/11

**Redistricting should make elections less predictable** -- The new California Citizens Redistricting Commission's draft maps have achieved at least one of the objectives that prompted voters to create the panel: They took partisan interests out of the equation. **MARTIN WISCKOL** in the [Orange County Register](#) -- 6/11/11

**Bay Area stable in draft of state political map** -- Most of Northern California's political landscape would remain comparatively stable, analysts said. San Francisco, however, would become one state Senate district instead of being split between two districts. **JOE GAROFOLI, CARLA MARINUCCI** in the [San Francisco Chronicle](#) -- 6/11/11

**New district maps would reshape the Valley** -- The San Fernando Valley's political landscape was shaken Friday as elected officials scrambled to stake early claims within newly proposed congressional and state legislative boundaries, and analysts forecast pitched election battles in 2012. **DAKOTA SMITH** in the [Los Angeles Daily News](#) -- 6/11/11

**Early district maps reveal overhaul of Valley politics** -- Fresno County, for instance, would be represented by five different congressmen. That would give the county -- population 930,450 -- more members of Congress than 18 states. **JOHN ELLIS** in the [Fresno Bee](#) -- 6/11/11

**Baca weighs run for proposed new congressional seat** -- Rep. Joe Baca, D-San Bernardino, says Democratic Party officials have asked him to consider running for a proposed new congressional seat that would represent Ontario, Chino, Montclair, Pomona and Rancho Cucamonga. **JAMES RUFUS KOREN** in the [Inland Daily Bulletin](#) -- 6/11/11

**Democratic challenger to Dreier 'totally emboldened' by new district lines** -- A potential Democratic challenger to Rep. David Dreier said he was "totally emboldened" by the new draft congressional maps that carve out some of the conservative strongholds of Dreier's current seat. Assemblyman Anthony Portantino (D-La Cañada Flintridge) has been raising money for months to challenge Dreier in 2012. **SHANE GOLDMACHER** LA Times [PolitiCal](#) -- 6/11/11

**Negrete McLeod to run for Congress: "I'm in, I'm in, I'm in, I'm in"** -- Within hours of seeing the draft maps of new congressional districts in California, state Sen. Gloria Negrete McLeod declared she is running for Congress. **SHANE GOLDMACHER** LA Times [PolitiCal](#) -- 6/11/11

**Councilman Tony Cardenas announces run for new congressional seat** -- Hours after a state commission released the first round of new congressional district maps, Los Angeles City Councilman Tony Cardenas announced his intention to run for one of the newly drawn seats in 2012. **ANTHONY YORK** in the [Los Angeles Times](#) -- 6/11/11

**Lynn Woolsey is NOT happy with redistricting map** -- Rep. Lynn Woolsey, D-Petaluma, is the first Bay Area House member to come out swinging against the first-draft maps released today by the California Citizens Redistricting Commission. **JOSH RICHMAN** [Politico](#) -- 6/11/11

**Three Sacramento-area Assembly Democrats land in same district** -- The Assembly maps approved today, which will serve as a starting point for further public comment, also have Democratic Assembly members Roger

Dickinson and Richard Pan bunched with Davis Democratic Assemblywoman Mariko Yamada in a Sacramento-West Sacramento-Davis district. **DAN SMITH** SacBee [Capitol Alert](#) -- 6/11/11

**New redistricting maps show South Bay losing seats in Congress, Assembly** -- New redistricting maps released today will drastically change the face of the South Bay's political landscape as the region loses two congressional seats, while the Palos Verdes Peninsula is more closely linked to its coastal neighbors. **ART MARROQUIN** in the [Torrance Daily Breeze](#) -- 6/11/11

**New redistricting maps would take SLO County away from McCarthy** -- Republican Rep. Kevin McCarthy would no longer represent San Luis Obispo County in Washington and Democratic Rep. Lois Capps would likely face a tougher fight for re-election if tentative redistricting maps released this afternoon hold up. **BOB CUDDY** [San Luis Trib](#) -- 6/11/11

**Proposed new political maps would make Central Coast a congressional battleground** -- An analysis of political data shows that, although it would have a slight Democratic tilt in voter registration, the proposed district would be a political toss-up. **TIMM HERDT** in the [Ventura Star](#) -- 6/11/11

**From:** Karen Clark

**Sent:** Thursday, June 16, 2011 12:52 PM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conf. Call

Everyone,

We will have a PR/Legislation conference call tomorrow, Friday, June 17 at 7:30 a.m. PST. Please note that Tom has another conference call to participate in at 8:00 a.m. PST so the PR call will only last 1/2 hour.

Let me know if you have any questions.

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** joe.findaro@akerman.com  
**Sent:** Thursday, June 16, 2011 1:43 PM  
**To:** kclark@westlandswater.org  
**Subject:** RE: PR/Legislation Conf. Call

thanks. will be on it.

[V Card](#) | [Bio](#) | [akerman.com](#)



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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, June 16, 2011 3:52 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Findaro, Joe (OC-DC); Sheila Greene; Susan Ramos  
**Subject:** PR/Legislation Conf. Call

Everyone,

We will have a PR/Legislation conference call tomorrow, Friday, June 17 at 7:30 a.m. PST. Please note that Tom has another conference call to participate in at 8:00 a.m. PST so the PR call will only last 1/2 hour.

Let me know if you have any questions.

Sincerely,

~Karen

*Karen Clark*  
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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Karen Clark

**Sent:** Thursday, June 23, 2011 10:49 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conference Call

All,

This is a reminder that we'll have a PR/Legislation conference call tomorrow (Friday, June 24) at 7:30 a.m. Call-in information is as follows: 800-■■■■-■■■■ pass code ■■■■

Thanks!

~Karen

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*Executive Assistant to Thomas W. Birmingham*

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*Fresno, CA 93703*

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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Bernhardt, David L.  
**Sent:** Tuesday, June 28, 2011 7:16 AM  
**To:** Tom Birmingham  
**Subject:** DC Trip

Tom: I wanted to see if we could get together for a few minutes while you are in DC, I know your schedule is packed so if it does not work that is fine. Also, I have told Joe that I can be available most of today and tomorrow, if needed for your hill meetings.

Best,  
David

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

To ensure compliance with requirements imposed by the IRS, we inform you that any federal tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

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**From:** Jason Peltier

**Sent:** Tuesday, July 5, 2011 9:46 AM

**To:** 'Tom Birmingham'; 'Daniel Nelson'; 'Craig Manson'; 'Julie MacDonald'; 'Bill Kahrl'; 'Ara Azhderian'; 'Joe Findaro'; 'Bernhardt, David L.'

**CC:** 'Dan Keppen'

**Subject:** FW: Executive Director's Report

**Attachments:** memo062811.doc

Here is Dan's latest report. Well worth a read as it covers the raft of issues the Obama Administration is pursuing, to our detriment.

---

**From:** Dan Keppen [mailto:[dankeppen@charter.net](mailto:dankeppen@charter.net)]

**Sent:** Wednesday, June 29, 2011 4:10 PM

**To:** 'Bill Kennedy'; 'Chris Hurd'; [daniele@errotabereranches.com](mailto:daniele@errotabereranches.com); 'Don Schwindt'; 'Harvey Bailey'; 'Pat O'Toole'; 'Ron Rayner'; 'Sandy Denn'; 'Tom Schwarz'; 'Anita Winkler'; 'Bill Plummer'; 'Bill Scott'; 'Brad Wind'; 'Bruce Whitehead'; 'Chris Udall'; 'Chris Voight'; 'Dan Laursen'; 'Daren Coon'; 'David Mansfield'; 'Delene Fletcher'; 'Gary Esslinger'; 'Gering Ft Laramie ID'; 'gering-ft laramie ID #2'; 'Grant Ward'; 'Ivan Ray'; 'James Broderick'; 'Jamie Mills'; 'Jason Peltier'; 'Jeff Sutton'; 'Joe Rutledge'; 'John McHugh'; 'John Sullivan'; 'Kent Heidt'; 'Larry Bauman'; 'Larry Hicks'; 'Larry Mires'; 'Lee Sisco'; 'Marc Catlin'; 'Marc Thalacker'; 'Mark Atlas'; 'Mike LaPlant'; 'Natasha Montgomery'; 'Norm Haak'; 'Norm Semanko'; 'North Platte Irrigators'; 'Paul Orme'; 'Randy Bingham'; 'Raymond Batten'; 'Richard Moss'; 'Ron Jacobsma'; 'Sandi Cox'; 'Sheldon Jones'; 'Ted Selb'; 'Tom Davis'; 'Tom Knutson'; 'Tom Myrum'; 'Wade Noble'

**Cc:** 'Gary Sawyers'; 'Mark Limbaugh'

**Subject:** Executive Director's Report

Dear Family Farm Alliance Directors and Advisory Committee Members:

Attached is this month's executive director's report (EDR), which is intended to keep you apprised as to what is happening behind the scenes on policy issues the Alliance is engaged in, some of which we will discuss on our next teleconference of the Board of Directors (ONLY!), scheduled for **Friday, July 1, 2011 at 12:00 p.m. (Pacific, including Arizona), 1:00 p.m. (Mountain); 2:00 p.m. (Central), 3:00 p.m. (Eastern).**

This report is intended for your use, but I understand that you may wish to share this information with your local board members and close associates. I would ask that you be circumspect when you share this information, however.

In the past month, Alliance activities have focused on developing and completing detailed comments to the Obama Administration protesting its draft Clean Water Act guidance, defining our Farm Bill platform and beginning work to create a coalition to work on related advocacy, and preparing for President Pat O'Toole's initial meeting of the AGree Advisory Committee held in Minneapolis (MINNESOTA). These issues and many others are discussed in the attached EDR.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Dan Keppen  
Executive Director



---

## MEMORANDUM

---

**TO:** BOARD OF DIRECTORS AND ADVISORY COMMITTEE  
**FROM:** DAN KEPPEL, EXECUTIVE DIRECTOR  
**SUBJECT:** EXECUTIVE DIRECTOR'S REPORT  
**DATE:** JUNE 29, 2011  
**CC:** MARK LIMBAUGH, JOE RAEDER, GARY SAWYERS

---

This executive director's report (EDR) is intended to keep you apprised as to what is happening behind the scenes on policy issues the Alliance is engaged in, some of which we will discuss on our next teleconference of the Board of Directors, scheduled for **Friday, July 1, 2011 at 12:00 p.m. (Pacific, including Arizona), 1:00 p.m. (Mountain); 2:00 p.m. (Central), 3:00 p.m. (Eastern).**

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### **FEDERAL ADMINISTRATIVE ISSUES**

#### **1. Keeping Alive Climate Change Policies that Put Fish and Wildlife Ahead of American Farmers**

There is broad scientific consensus that even modest changes in the global climate will likely alter precipitation patterns in ways that could pose serious threats to water supplies and agricultural production worldwide, particularly in arid regions such as the American West.

Unfortunately, preservation of domestic agricultural production was not a defined goal of S. 1733 as reported by the Environment and Public Works Committee or of H.R. 5424 as passed by the House in the last Congress. However, despite the failure of this philosophy to gain approval in the last Congress, this Administration is using several other forums to create national climate change policy that puts the needs of fish and fur in front of farmers. The Obama Administration recently announced two climate adaptation initiatives and have provided less than 60 days for the public to comment on the plans. The first Administration plan could impact the management of freshwater resources in the U.S. to deal with the effects of climate change. The "Draft National Action Plan for Managing Freshwater Resources in a Changing Climate" offers recommendations on how federal agencies can support state and local governments by sharing data and following certain best practices. The plan announces a new national goal: *Government agencies and citizens collaboratively manage freshwater resources in response to a changing climate in order to assure adequate water supplies, to protect human life, health and property, and to protect water quality and aquatic ecosystems.* The report includes the following recommendations for federal agencies to follow, including:

- Improve the quality of water resources and climate change information available to decision makers;
- Expand use of water efficiency practices and technologies;
- Develop a list of the most effective conservation practices for state and local officials;

The second announcement seeks public comments on the "National Fish, Wildlife and Plants Climate Adaptation Strategy" by July 1. The strategy will provide a "unified approach reflecting shared principles and science-based practices for reducing the negative impacts of climate change on fish, wildlife, plants, habitats, and our natural resource heritage."

Over in the Department of Agriculture, Secretary Vilsack recently introduced a framework for assessing and tracking changes to watershed conditions, with an emphasis on climate change. In August 2009, Secretary Vilsack stated that restoration for him meant "managing forest lands first and foremost to protect our water resources while making our forests far more resilient to climate change". This politically correct mantra was typical of the sound bites coming out of the Obama Administration and members of Congress who were rallying behind climate change legislation that was moving through Congressional committees at the time. A quick perusal of the new USDA watershed document suggests that this is just the latest forum where ivory tower policy makers and appointees within the Administration are taking climate adaptation strategies rejected by Congress and injecting them into administrative channels with no Capitol Hill oversight.

The basic problem with the USDA report is that it is premised on at least two false assumptions: That there is a need for federal intervention in watershed planning and that the federal government can be helpful in those efforts by taking a "hands on" approach. If Congress is intent on doing something in the area of regional or watershed planning, it should dedicate funding in the form of grants to regional planning efforts, distribute those funds, and then step back and let the local and state watershed groups get the job done on the ground. The USDA

report puts high emphasis on those watersheds with designated wilderness and habitat protection areas, wild and scenic rivers, and those which provide source water for municipalities. The report places virtually no emphasis on the people who actually live or work in the watershed. Ranchers who hold federal grazing permits and local producers probably understand the nuances of local watersheds better than anyone. The USDA report makes no mention of coordinating with local producers during the preparation of the report or in its recommendations for the future.

## **2. Saving One Thing, Doing Another**

Making things worse is the Administration's apparent deceptive and condescending attitude towards American farmers and ranchers. EPA administrator Lisa Jackson has been making the rounds lately in farm country, and she has publicly stroked farmers and ranchers for the respect and stewardship that they provide the environment. No doubt the agricultural community appreciates those thoughts, but it also pretty clearly looks like this is a calculated public relations move. Unfortunately, EPA is saying one thing on the road in farming communities, while the bureaucrats in Washington continue to write new regulations that will make agricultural operations more difficult. While Lisa Jackson is touring the country and telling rural communities that EPA is not coming after them, we are working overtime trying to stay on top of the barrage of rulemaking and letting our members know what is coming down the pike.

Congress refused to enact Clean Water Act "reform" language. Congress refused to enact climate change mitigation legislation. The Administration has apparently decided to plow ahead on these issues anyway, regardless of congressional intent. To make matters worse, they are not doing this through a full rule making process where they would have to do actually respond and address public comments. Senator Johanns (NEBRASKA) earlier this month perhaps captured this disturbing development best: "Instead of spouting charming verbiage about the benefits of increased regulation, EPA should be looking for way to work with farmers and ranchers and small businesses to find solutions to environmental challenges while creating jobs for Americans who are out of work," he said. "Unfortunately, based on what we've seen over the past couple of years, EPA used agriculture producers as offenders, not partners."

Even agencies that have been traditional allies of agriculture now appear to be talking down to farmers. Earlier this month, U.S. Secretary of Agriculture Tom Vilsack addressed *Innovation in American Agriculture, Sustainable Solutions to Help Feed the World* (<http://content.govdelivery.com/bulletins/gd/USDAOOC-8cd15>): "To meet future challenges, we must help farmers adopt the latest seed technology, improved irrigation systems and land and animal management techniques," he said. "We must help them appropriately apply fertilizers, pesticides and herbicides if need be. We must help them regulate the safety of their food systems, and engage in the global trading system so that food supply can reach demand." (Emphasis added).

While it is nice to see the Secretary focus on the issue of agricultural demand and meeting the needs of the current and future global population, his remarks, unfortunately, carry with them the

same condescending tone that other prominent spokespersons in this Administration employ when talking about American agricultural producers.

### **3. A Disconnect Between Washington and Rural Western Communities**

There appears to be a disconnect right now between the policy makers in Washington, D.C. and the producers who work on the ground and who are intimately familiar with their local environment. Many political appointees with oversight of natural resources issues in this administration formerly worked for activist, litigious environmental organizations (e.g. Natural Resources Defense Council) who concentrate much of their energy on attacking Western irrigated agriculture. And it appears that this trend is continuing:

- ☞ President Obama recently announced that he intends to nominate Mr. Ken Kopocis to be the next assistant administrator for the Office of Water at EPA. Mr. Kopocis worked on the Hill for the House T&I Committee as well as the Water Resources and Environment subcommittee. During that time, Kopocis worked closely with Chairman Jim Oberstar (D-Minn.) in his repeated efforts to try to amend the Clean Water Act by dropping the word "navigable". Many Western farmers and ranchers saw Mr. Oberstar's legislation as a federal power grab and an unconstitutional expansion of the law. Those same arguments have cropped up over the Obama administration's new "guidance" concerning the Clean Water Act, essentially a regulatory effort to do what Congress could not. Mr. Kopocis would fill the seat that Pete Silva vacated four months ago. Nancy Stoner, formerly of the Natural Resources Defense Council, moved up from deputy to become acting assistant administrator in Silva's absence. (I should note that, despite Mr. Kopocis' relationship with Mr. Oberstar, Mark Limbaugh and others consider him to be a reasonable and thoughtful policy expert.)
- ☞ President Obama has nominated the leader of a conservation group that has opposed irrigators in several Western watersheds in recent decades to be the Interior Department's next assistant secretary for fish, wildlife and parks, a position that oversees national parks and the Fish and Wildlife Service. Rebecca Wodder, who since 1995 has served as CEO of American Rivers, could draw opposition from some in the Senate over her group's positions on hydroelectric power and river restoration, particularly in the West.
- ☞ President Obama has nominated environmentalist and former utility executive John Bryson to lead the Commerce Department. The former chairman and CEO of California-based Edison International, Bryson also co-founded the Natural Resources Defense Council in 1970 and more recently served on the United Nation's advisory group on energy and climate change. If confirmed by the Senate, Bryson would oversee the NOAA and NMFS, currently at the center of the Administration's climate change and global warming research.

Perhaps it is no surprise that the Administration's reliance on environmental litigators for policy direction has led to decisions that has the agricultural community hopping mad, including a recent proposed settlement that will essentially use taxpayer money to reward one of the most

litigious environmental groups in the country for suing the government (see May 2011 Executive Director's Report).

#### **4. White House Council on Environmental Quality (CEQ): Economic and Environmental P&G for Water and Related Resources Studies**

The White House in December released a draft of new standards for federal water projects that for the first time put environmental goals on the same plane as economic development concerns. The proposed overhaul of 1983 standards for the Army Corps of Engineers (Corps) directs the agency to fold non-monetary benefits into project assessments by measuring improvements to wildlife habitats and biodiversity. These proposed changes in the Principles and Guidelines for the Corps and Reclamation may have a significant impact on new water project planning and federal funding in the future.

The 1983 *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&G) apply to the Corps, Reclamation, and the Natural Resources Conservation Service (NRCS). The White House has not pinpointed which other agencies would fall under the umbrella of new guidelines, but experts said likely candidates include the EPA, NOAA, and the Agriculture and Interior departments. Agencies that deal indirectly with water issues could also be included.

Existing water policy promotes both the economy and the environment. Instead of balance, however, recent efforts –driven by environmental interests – could change U.S. water policy to elevate environmental and ecological considerations above all others. Notably, the draft encourages a new policy for flood-plain management. It directs planners to consider nonstructural approaches - typically, using building codes, planning laws and education campaigns to manage flood plains and protect public safety, wetlands and other natural resources- rather than proceeding with the construction of levees and dams. The CEQ policy is nearing completion, with the first portion (the “policy” part) expected to be released later this month.

The Alliance has joined a coalition of like-minded organizations who view the new rules (now called, ominously, “Policies and Requirements” or “P&R”) as a way of ultimately redirecting billions in annual federal investment away from infrastructure projects and toward environmental restoration projects. These groups include: Association of California Water Agencies, NWRA, Oregon Water Resources Congress, Texas Water Conservation Association and the Western Coalition of Arid States. Earlier this year, we co-signed a letter to policy officials with the Office of Management and Budget (OMB) that formalized our request that OMB engage in a public and transparent review of both the effort and the document produced by the CEQ. It appears that interested potential allies on Capitol Hill who might fight back would prefer to wait and be reactive to the efforts of the Administration on the new P&R. So, our very loose game plan is to hold off on requesting oversight hearings until after a presidential executive order is issued on the P&R. In the mean time, Peter Carlson in Washington, D.C. is acting as the clearing house to



share each organization's materials on the P&G/P&R effort among our groups.

## **5. Environmental Protection Agency (EPA)**

### **a. Clean Water Act Guidance**

Last week, I transmitted our formal comment letter to EPA and the Corps on proposed Guidance Regarding Identification of Waters Protected by the Clean Water Act, referred to as "draft guidance". Our letter emphasizes the Family Farm Alliance concern that Clean Water Act (CWA) jurisdictional issues are uncertain, particularly in areas where Western farmers and ranchers store, move and apply water for irrigation. Section 6 of the draft guidance, which addresses "other waters" of the U.S., is particularly vague. This uncertainty brings with it the risk of additional regulations, time-consuming and potentially expensive procedures, expanded opportunities for litigation, and a shift from local and state water management towards increased federal agency regulation and oversight. While the draft guidance would theoretically preserve current CWA exemptions enjoyed by the agricultural community such as the agricultural return flow exemption and the agricultural operations exemption, the draft guidance's approach to defining "other waters" is so expansive that it could be interpreted to render such exemptions meaningless. Our farmers and ranchers simply do not need another layer of difficulty added to a profession that is already saddled with significant challenges.

Further, we do not believe that additional enforcement and regulation are needed at this point. The case for expanded federal jurisdiction of the CWA and attendant tightened regulation has been greatly exaggerated, in our view. Finally, the draft guidance is seen by many of our members as a "rule in disguise". We have asked that it should be withdrawn, and EPA and the Corps should commence with a transparent, formal rulemaking process.

After our letter was transmitted to EPA and the Corps, we distributed an "Issue Alert" that summarizes key concerns and also urges our membership to develop letters of their own or to incorporate by reference our letter in their transmittals to EPA and the Corps.

Earlier in the month, the Alliance joined dozens of other national organizations and urged EPA and the Corps to extend the public comment period for the draft guidance. We requested EPA to consider extending the comment period so the full extent of the effects of the guidance can be analyzed and expressed in comments. While EPA spokespersons had initially hinted that the comment period would not be extended, the Administration later agreed to push back the comment deadline to July 31, 2011. The Alliance has worked with a variety of other organizations representing the "regulated community" to share resources and assess the draft guidance. These efforts culminated in the development of the letter that was sent to Administration officials last week. The 30-day extension will help other organizations sufficient time to prepare substantive and helpful comments on the draft guidance as well as intelligently identify the real potential impacts to their communities. The draft guidance will not be

implemented until it is finalized sometime this fall. For more information on this issue, go to (<http://www.whitehouse.gov/administration/eop/ceq/initiatives/clean-water>).

Thanks to all of you who took the time to review previous drafts and provide suggested improvements to our letter. Please feel free to circulate our letter to your colleagues. If you have any questions or require further information on this matter, please do not hesitate to contact me.

b. Coal-Fired Power Plants: Navajo Generating Station and Others

EPA has set a schedule to make decisions on four Western states' plans (COLORADO, MONTANA, NORTH DAKOTA, WYOMING) for clearing up haze at national parks, setting the stage for new rules that could require 18 coal-fired power plants to install pollution controls, switch to natural gas or shut down. The agency agreed to the schedule as part of a new settlement with environmental groups, which sued the Obama administration earlier this year for missing a deadline in the Clean Air Act. Under the deal, which was published in the June 15<sup>th</sup> *Federal Register*, EPA will be required to make up-or-down decisions next year on the visibility plans that were submitted by the states. If the agency decides that the state plans won't do the trick, it will need to impose federal standards in their place.

Congress is taking notice of the economic impacts associated with proposed air visibility standards contemplated by EPA for coal-fired power plants, including the Navajo Generating Station (NGS), located near Page (ARIZONA). Alliance Advisory Committee Member Paul Orme (ARIZONA) teed this issue up in April when he appeared before an oversight hearing conducted by the House Water and Power Subcommittee. Paul's testimony focused more specifically on the impact in the farm communities in Central Arizona. Dan Thelander, a partner with the Tempe Farming Company and the Vice-President of the Maricopa Stanfield Irrigation and Drainage District (MSIDD), appeared before the May 24 joint oversight hearing conducted by House subcommittees about the current and future role of NGS. In Thelander's testimony, he pointed to the frustration he and other Central Arizona Project (CAP) farmers are feeling about EPA's actions.

Earlier this year, the Alliance submitted a letter to nearly two dozen Congressional committee chairs, ranking members, and the Arizona delegation regarding concerns with the NGS. Some of the emission control options being considered by the EPA at the Navajo plant, if adopted and implemented, would render CAP water an uneconomical water resource option for agriculture in Arizona. And, for those farmers unable to access water resources other than CAP water, the EPA options would place these producers' viability as a business in jeopardy. Meanwhile, in the U.S. Senate, Sen. Lisa Murkowski (ALASKA) sent a letter to the Federal Energy Regulatory Commission (FERC) asking whether the agency is collaborating with EPA on proposed rules that could shut down coal plants throughout the West. Among other questions, Senator Murkowski want to know whether FERC is collaborating with EPA to understand the impact of proposed clean air and water rules on the retirement of certain electric generating units. This

questioning is right in line with the Alliance's concerns expressed on potential conditions on the Navajo Generating Station FERC license.

c. Nutrient Standards

EPA is "prepared to withdraw" part of its federal standards for nutrient runoff and delay estuarine criteria in Florida if the state environmental agency develops and adopts its own standards. The announcement is a response to an April letter from the state Environmental Protection Secretary to EPA Administrator Lisa Jackson, asking the federal agency to withdraw a January 2009 proposal that lays out nutrient criteria. EPA had singled out the state of Florida as the first state in the nation in which they are proposing to establish a nutrient standard for all bodies of water. These proposed standards are being imposed on the basis of an EarthJustice lawsuit and will establish nitrogen and phosphorus standards different from the rest of the country. Florida farmers say cutting fertilizer use to lower nutrient levels would cripple their yields and raise crop prices. While the proposed new regulatory provision would be specific to nutrients in Florida, a coalition of environmental groups is pressing the agency to set nutrient criteria for Wisconsin waters. EPA is not withdrawing the January 2009 proposal but instead will hold it "in abeyance" while the Florida Department of Environmental Protection comes up with its own standards.

## **DEPARTMENT OF THE INTERIOR**

### **6. WaterSMART Funding Available for Desert and Southern Rockies Landscape Conservation Cooperatives**

The Bureau of Reclamation is seeking proposals for applied science projects that can help resource managers develop adaptive strategies to mitigate the impacts of climate change, drought, invasive species and similar challenges to water supplies, aquatic and riparian habitat, and environmental quality. The proposals would benefit resource management activities in the geographic areas covered by the Desert and Southern Rockies Landscape Conservation Cooperatives. Reclamation Commissioner Mike Connor said funding is available for projects that can best address resource challenges and inform future management activities. Interested organizations and parties must submit proposals as outlined in two separate Funding Opportunity Announcements released earlier this month at <http://www.grants.gov> The deadline for submissions is August 4, 2011. Links to the announcements are at <http://www.usbr.gov/WaterSMART>

The federal funding comes from Interior's WaterSMART Program, which focuses on improving water conservation and sustainability, and helping water resource managers make sound decisions about water use. It identifies adaptive measures to address climate change and its impact on future water demands and reflects input the Alliance provided as its authorizing legislation moved through Congress.

## **DEPARTMENT OF DEFENSE**

### **7. U.S. Army Corps of Engineers (Corps)**

#### **a. National Committee on Levee Safety (NCLS)**

The NCLS was created in WRDA 2007, and tasked with making recommendations to Congress on a future National Levee Safety Program (NLSP). However, we are concerned that they have included in their draft recommendations, as well as in draft legislation (from the non-federal Committee members), that water delivery canals and ditches in the West be included in a levee safety program. Reclamation already has a program for federally owned canals and ditches that is dealing with safety standards and facility condition assessments that will improve safety conditions across the West where there is a risk of damages resulting from potential canal failures. We view the NCLS recommendations as duplicative of existing federal programs.

While in Washington D.C. during last month's farmer lobbyist trip, the NCLS was a key topic of our discussions. Mark Limbaugh and I were joined by Tom Donnelly (NWRA) and Abby Schneider (ACWA) for a 30-minute meeting with Steve Stockton, Chair of the NCLS and the highest ranking official in the Civil Works division of the U.S. Army Corps of Engineers. He expressed a willingness to work with us on this further, and search to find a mutually acceptable definition for "canal" and "levee" that would include those urban facilities that contributed to the levee failure in New Orleans after Hurricane Katrina, but leave out canals like the ones our members use to deliver water.

Since returning from Washington, Mark and I have participated in several conference calls to prepare proposed definitions for Mr. Stockton. We have circulated draft language for you to review. Meanwhile, Alliance representatives and allies in Washington, D.C. have been meeting with Congressional Committee staff to advance our concerns. Earlier this year, key committees were sent a joint recommendation letter from the Alliance, NWRA and ACWA that highlighted our collective concerns about the NCLS inclusion of Western water delivery canals and ditches within their proposed levee program.

## **ACTIVITY IN CONGRESS**

### **8. Energy and Water Development Appropriations**

On June 15<sup>th</sup>, the House Appropriations Committee approved the FY 2012 Energy and Water Development Appropriations Bill, clearing the bill for consideration by the full House of Representatives. The bill is currently scheduled to be taken up by the House the week of July 4<sup>th</sup>. The bill was approved by the Energy and Water Development Subcommittee on June 2<sup>nd</sup>. In total, the bill recommended provides \$30.6 billion for the programs of the U.S. Army Corps of Engineers, the Department of the Interior's Bureau of Reclamation, the Department of Energy

and several independent agencies. This total is about \$1 billion below FY 2011 and almost \$6 billion below the President's budget request.

For the Corps of Engineers, the bill provides a total of \$4.8 billion, \$89 million below FY 2011 but \$195 million above the President's request. The Committee has recommended no new starts in either the Investigations or Construction accounts for FY 2012. The bill includes no new funds for any of the Corps' Continuing Authorities Programs, directing the Corps to use available carryover funds to continue ongoing projects.

For the Bureau of Reclamation, the bill includes \$971 million, \$91 million below FY 2011 and \$47 million below the President's budget request. For the Water and Related Resources account, the bill provides \$822,300,000, \$89 million below the current year but \$17 million above the budget request. The bill provides no funding for the San Joaquin River Restoration Fund, for which the Administration had requested \$9,000,000 in a separate account. The Central Valley Project Restoration Fund is funded at \$53,068,000, the same as the President's request. The Committee directs that these funds be expended in accordance with the budget request. The California Bay-Delta Restoration Program would be funded at \$35,928,000, \$3.7 million below the request. The Committee directed that the reductions be applied proportionally to the activities proposed in the budget request.

## **9. Bills to Restrict EPA Powers Introduced in House**

Legislation with bipartisan support that aims to stop EPA from boosting oversight of water pollution, wetlands destruction and mountaintop removal mining went to markup last week before the House Transportation and Infrastructure Committee. The bill – H.R. 2018 – was ordered to be reported (amended) by a 35-19 vote. The bill shifts regulatory actions over waters and wetlands to the states and prohibits EPA from rejecting state clean water protections and inserting tougher federal standards. The bill is a clear reaction to EPA's recent moves to impose strict, numeric water pollution limits on water bodies in Florida (see Item 5c), and to tighten environmental reviews of wetlands-filling permits issued by the Army Corps of Engineers. House Transportation and Infrastructure Chairman John Mica (R-FL) and Ranking Member Nick Rahall (D-WV) introduced the legislation to restrict EPA's powers under the Clean Water Act, especially when intervening with state oversight programs. It restricts EPA's ability to issue revised or new water quality standards without the state's permission. Environmentalists and their allies in the mainstream media are rabid over this move. "The administration must make sure that this reckless provision does not make it into the Senate version of the spending bill. Americans care deeply about clean water. They want more protections, not fewer," a recent New York Times editorial intoned.

Meanwhile, Rep. Cathy McMorris Rodgers (R-WASHINGTON) and seven other members of the House Energy & Commerce Committee earlier this month introduced the *EPA Regulatory Relief Act*. This bipartisan bill would aid job creators by directing EPA to develop better standards for

industrial, commercial, and institutional boilers and incinerators, grant the EPA more time to develop those standards, and grant companies more time to comply with them.

## **10. Farm Bill**

The Family Farm Alliance played an active role in the development of the last Farm Bill. In particular, working with a diverse coalition of commodity groups, conservation organizations, and urban water users, we collectively advocated for a framework that ultimately became the Agricultural Water Enhancement Program (AWEP). We intend to work in a similar manner again on this Farm Bill. Pat O'Toole transmitted a letter to NRCS Chief Dave White in Montana a few weeks ago. It describes the key goals our organization has been advocating towards with respect to the Farm Bill:

- Encourage youth to join and stay in agriculture. The Alliance is concerned that over half of today's active farmers and ranchers are between 45 and 64 years old. We must find ways using the Farm Bill to encourage young farmers and ranchers to stay with agriculture.
- Improve AWEP. Much of our letter to Chief White provided recommendations on how to improve AWEP implementation.
- Facilitate low impact, low head hydropower development within existing water delivery systems (e.g. irrigation canals).
- Encourage incentive-driven conservation programs.
- Inject more local and state control of the funding for those programs;
- Eliminate duplicative accounting services associated with NRCS conservation programs;
- Increase emphasis on really fixing deteriorating forested watersheds; and
- Streamline program implementation.

We will continue to work with other water users and conservation groups who share a common interest in supporting working ranches and healthy landscapes and to ensure that continued emphasis is placed in the Farm Bill to support incentive-driven conservation programs. Thousands of water and land conservation projects have been completed across the Western United States, and these efforts should continue. We will urge policy makers to give Farm Bill conservation programs a priority and fund those programs accordingly.

Pat and I are starting outreach efforts to reunite our former AWEP coalition and solicit interest on a coordinate approach to advocate with like-minded interests our Farm Bill agenda, using our letter to Chief White as a basis for our policy platform. The response so far – especially from conservation interests like Environmental Defense, Trout Unlimited and The Nature Conservancy – has been positive.

We have also been working with associates in D.C. who oversee AWEP and other water conservation programs for NRCS. So, no great surprise, but agency officials think everything is

great with AWEF, and point to the fact that there is much more demand for the program than available funding. For us to overcome this resistance and get any serious political traction during the Farm Bill negotiations, we will have to be able to show that, in fact, it would be cheaper for an irrigation district to handle the money than NRCS. Accountability will always be a concern, too. We will likely have to build a factual case to get any interest on Capitol Hill. As you can imagine, the Hill will have these very same conversations with the Administration. We need to anticipate and beat this. Additionally, AWEF will need help to compete given the shortage of money and the interest in the many Farm Bill programs. Finally, NRCS program officials apparently believe that low-head hydro would be fundable under EQIP. This is an issue that we should be able to get traction on.

### **11. Government Litigation Savings Act**

U.S. Representative Cynthia Lummis (R-WYOMING) and Senator John Barrasso (R-WYOMING) have jointly introduced the Government Litigation Savings Act (GLSA), legislation that prevents abuse of the Equal Access to Justice Act (EAJA) by large environmental groups and others who frequently challenge the federal government in court. The GLSA, authored by Rep. Lummis, would reduce the taxpayer's burden to pay for attorney's fees. The legislation also returns EAJA to its original intent by instituting targeted reforms on who is eligible to receive EAJA reimbursements, limiting repeated lawsuits, and reinstating tracking and reporting requirements to make EAJA more transparent. Under the GLSA, veterans, social security claimants, individuals and small businesses will still enjoy full access to EAJA funds. The GLSA is co-sponsored by several Republican members of both the Senate and House Western Caucuses. The bill has also been endorsed by over 85 agriculture, sportsmen, recreation and energy groups.

Our last conference call, the board and Advisory Committee agreed that the Alliance should take a "support" position on the GLSA, with some suggestions on how the bill could be further improved. I drafted the letter, shared it with the board and Advisory Committee, and Mark Limbaugh submitted a final letter to Rep. Lummis' office last week.

### **12. H.R. 872: Pesticide Permitting**

Senate Agriculture Committee members passed H.R. 872, the Reducing Regulatory Burdens Act of 2011, out of their committee earlier this month. The bill passed the House of Representatives earlier this year and was then referred to the Senate Agriculture Committee on April 4. This bipartisan legislation would block new regulations that would subject farmers, mosquito control districts, and others to duplicative permitting and tens of thousands of dollars in counter-productive fines.

EPA in late April announced plans for a July 30 release of final secondary permit requirements for pesticide users who spray over water. The agency was required to develop its new pesticide general permit under the National Pollutant Discharge Elimination System (NPDES) by the 2009

federal appeals court ruling in *National Cotton Council v. U.S. EPA* that said EPA's current pesticide permitting under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) is insufficient for those who spray over water. Those pesticide sprayers would be required to obtain the new permits by Oct. 31, the date mandated by the court after EPA obtained a six-month extension in late March. EPA officials say the permit will require pesticide users to submit new records to EPA. It will also require pesticide users to only use the amount needed for the targeted pest. Earlier in April, EPA issued the draft version of the permit and is currently reviewing how the final rule may be affected by the ESA with other agencies. In the West, EPA has permitting authority over Idaho, New Mexico and Oklahoma. In the 44 other states, local regulators are required to develop similar permits by Oct. 31.

Family Farm Alliance members believe current pesticide permit requirements under FIFRA are sufficient. H.R. 872 is necessary to address negative economic and public health consequences of the ruling posed by the case *National Cotton Council v. EPA*. Under the court ruling, pesticide users would have to obtain a duplicative permit under the federal CWA or be subject to a fine of up to \$37,500 per day per violation. The new permitting process would not only endanger public health by subjecting mosquito control districts to new permitting requirements under the CWA, it would put further strain on states whose agencies would have to establish new systems to administer and comply with the requirements. The bill amends the FIFRA and the CWA to clarify Congressional intent and eliminate the requirement of a NPDES permit for the application of pesticides already approved for specific use under FIFRA. Alliance Advisory Committee member Norm Semanko and his allies in Idaho played a huge part in the successful House and Senate committee passage of this bill.

Meanwhile, environmental activists are doing an end-run around Congress and are appealing directly to the Administration for help. Some 133 groups wrote to EPA Administrator Lisa Jackson on June 16<sup>th</sup> urging EPA to protect endangered wildlife and human health in its oversight of pesticides. EPA "has consistently attempted to downplay mounting evidence demonstrating that even low doses of pesticides in wildlife and humans can have dramatic and irreversible consequences," the groups, led by Center for Biological Diversity and Pesticide Action Network North America, assert. The groups claim the ESA offers stronger protections than FIFRA for endangered species as "it requires a more rigorous scientific review process that is less susceptible to industry influence." In addition, the ESA considers synergistic and cumulative effects "in ways not accommodated by FIFRA."

### **13. A Proposal to Modify the Tax Code to Facilitate Water Transfers**

On our last teleconference call, Advisory Committee member Larry Mires (MONTANA) reported that there appears to be an effort to promote "efficiency of water usage", possibly driven by Senator Baucus (MONTANA) and Senator Mark Udall (COLORADO) through potential legislation that would enable mutual ditch and irrigation companies to enter into water transactions without jeopardizing their tax-exempt status. It appears this legislation – "The Water and Energy Conservation Act of 2011" - would recognize that donations of water qualify as charitable



donations under the tax code. It is intended to encourage voluntary donations of water for in-stream flows thereby helping fisheries and recreation interests in Western states. Many participants on the call expressed concern that this is simply a backdoor attempt to take water from agriculture for environmental purposes. I circulated the materials provided by Larry after our last call, and Mark Limbaugh advised that everyone take a hard look at this. So far – no response, Alliance brethren. Please take a look at those materials and advise me of any concerns or suggestions you may have. We may need to cut this off at the pass before it gains momentum.

## **ALLIANCE INITIATIVES AND ACTIONS**

### **14. 2012 Annual Meeting and Conference: February 22-24, 2012**

We have finalized our contract with the Monte Carlo Resort and Casino for our 2012 Annual Meeting and Conference, which is scheduled for February 22 – 24 in Las Vegas.

### **15. Low-Impact Hydropower Initiative**

#### **a. Background**

The Family Farm Alliance last year worked hard to make it easier for Western irrigators to develop new low-head hydropower. The Alliance board of directors in February 2010 established a priority initiative intended to serve many of our farmers and ranchers who are interested in installing low-head hydropower facilities in existing irrigation canal systems. Under current regulations, anyone who wants to develop hydropower less than 5 megawatts (which would apply to virtually every single potential location within irrigation canals) can get an exemption from FERC licensing requirements. However, the process required to get that exemption can cost \$100,000 and 18-36 months just to satisfy NEPA compliance requirements. Our Low-Head Hydropower Committee convened several times last year via teleconference, and this Committee has played a key role in helping committee staff in both the House and the Senate craft hydro legislation last year and in this Congress.

#### **b. Recent Legislative Developments**

Over the past several months, we worked with Water and Power Subcommittee staff and staff members from Rep. Adrian Smith's (NEBRASKA) office on draft legislation that is a similar iteration of a bill introduced in the last Congress. It is intended to spur the development of small-scale hydro projects in conduits, canals and other water delivery structures. Rep. Adrian Smith (R-NEBRASKA), along with Rep. Jim Costa (D-CALIFORNIA), in February reintroduced the Small Scale Hydropower Enhancement Act to exempt hydropower projects generating less than one and a half megawatts from the Federal Energy Regulatory Commission's permitting rules.

In the Senate last year, the Alliance worked with Sen. Lisa Murkowski's (ALASKA) staff to craft and generate support for "The Hydropower Improvement Act of 2010" which provides: 1) the development of a competitive grant program; 2) a new conduit pilot project program; and 3)

public workshops intended to improve coordination and achieve a common understanding of documented challenges associated with known regulatory barriers. Earlier this year, we worked with leadership from Senate Energy and Natural Resources Committee to re-introduce a new version of Sen. Murkowski's bill, with co-sponsorship from Senators Bingaman (NEW MEXICO), Risch (IDAHO), Wyden (OREGON), and Cantwell (WASHINGTON). "The Hydropower Improvement Act of 2011" (S. 629) was recently reported out of committee.

We are on record as formally supporting both bills.

c. Recent Alliance Engagement

The House Water and Power Subcommittee last week held a legislative hearing on Rep. Adrian Smith's Small-Scale Hydropower Enhancement Act of 2011 (H.R. 795) – see above. This hearing was the first in a series of general hydropower-related bills to be heard by the Subcommittee this year. Gary Esslinger (NEW MEXICO) testified on behalf of Elephant Butte Irrigation District and the Family Farm Alliance in support of the bill, which appeared to receive bipartisan support from subcommittee members during the hearing. Despite promising opportunities for low-head, low-impact hydropower development in the West, Gary explained that the FERC licensing process is outdated and slow-moving. His testimony expressed hope that H.R. 795 will alleviate these administrative bottlenecks by effectively exempting low-head hydropower developed on structures like ones in his district, which are located within existing irrigation canal systems, from the FERC process altogether.

Bob Lynch, an attorney who represents several water agencies in Arizona, also testified in support of the bill. Bureau of Reclamation Deputy Commissioner Robert Quint offered the Obama's Administration's position on the bill, which promotes a belief that environmental laws should continue to apply even if permitting requirements were lifted and urged that the bill wait until the department finished studies by the end of the year. Sources in Washington tell us that Reclamation was supporting the bill up until the last minute, when political pressure from higher up in the Administration influenced Reclamation's final public position stated at the hearing.

In a related matter, as I reported last month, we were invited to participate in a conference call by the U.S. House Water and Power Subcommittee staff to discuss initial areas of agreement, concern and possible steps to resolution regarding a second hydropower hearing and a new bill, this one likely dealing with federal canal-based hydro. The new bill the Subcommittee staff is contemplating would necessarily have to satisfy three overarching principles: 1) No new costs to taxpayers; 2) Streamlined regulatory relief; and 3) Adherence to "beneficiary pays" principle. Subcommittee staff is now drafting some principles that capture the areas of agreement voiced on the call, which I will share with our Low Head Hydropower Subcommittee. A July 7 hearing on this bill is also being considered, and the Alliance has been asked to testify, if that occurs.

## **16. Colorado River Ag/Urban/Enviro Water Sharing Work Group**

We continue to engage in the Colorado River Ag/Urban/Enviro Water Sharing Work Group, where we have developed recommendations for the Western States Water Council (WSWC) in the context of toolbox strategies to increase the chance that WSWC might get the governors behind at least some of our recommendations. The Alliance in April signed on to a group letter to WSWC and WGA supporting their work on water sharing, which was transmitted to the WSWC prior to its April meeting. WSWC was unanimous in their desire to take up the ag/urban/environmental water sharing issue under the WSWC/WGA umbrella, building on the foundation our initiative provided. Specifically, they have submitted a proposal for probable funding to work closely with the states to flesh out the 11 strategies—to look at what stands in the way of their being used in other places throughout the West. The Walton Family Foundation has agreed to a small amount of funding for related outreach efforts.

In a related matter, I have been invited to the upcoming Innovative Water Transfers Workshop hosted by the Western Governors' Association and the Western States Water Council (WSWC). This initiative will focus on state-level programs, institutional arrangements, and administrative practices that can facilitate innovative water transfers. The project will produce a toolbox of strategies, identify options for new programs or administrative practices, and set forth policy recommendations for states to consider – with a focus on activities that can be implemented at the state level. The workshop will include a small group comprised of practitioners, state water managers, and experts in the field of transfers. The workshop will precede WSWC's Summer Council Meeting in Bend (OREGON).

## **17. Resource Conservation Act Blue Ribbon Panel**

Alliance President Pat O'Toole last year was appointed to a Blue Ribbon Panel established to support the development of the NRCS Program and Policy Statement. This process will hold considerable weight in forming the administration policy platform that will influence how the Farm Bill is developed in Congress. Pat participated in three Western regional workshops and other Family Farm Alliance leaders were chosen to speak at the regional workshops, as well. Dick Moss (CALIFORNIA), Marc Thalacker and I delivered presentations in Portland (OREGON) while Alliance members Dan Thelander and Brian Betcher (ARIZONA) spoke to the workshop in Tempe (ARIZONA). The Alliance message was consistent at the regional meetings and the D.C. forum: *Family Farm Alliance comes to the table with solutions that work in the real world*. We support incentive-driven conservation programs, more local and state control of the funding for those programs, and streamlined implementation. Now that the Panel has completed its duties, we await to see how the Administration will factor in their recommendations.

## **18. Johnson Foundation Environmental Forum**

As you know, Alliance President Pat O'Toole and I have been engaged over much of the past

two years in a process hosted by the Johnson Foundation that led to the June 2010 “Freshwater Summit”, which took place at Wingspread, near Racine, Wisconsin. Government, industry and non-profit sector chieftains and experts, representing diverse interests and perspectives, sat side-by-side at the table to deliberate and finalize an urgent call to action for a national strategy to address the looming freshwater crisis facing the U.S. The *Call to Action*, released last September, is the culmination of an intensive two-year, diverse collaboration of leaders from business, nongovernmental organizations, agriculture, academia, government, foundations and communities. It explores the nature and breadth of the United States' freshwater challenges, attempts to articulate potential solutions to those challenges and offers recommendations to ensure domestic freshwater resources are secure for the 21st century.

After the big splash in September with the unveiling of the *Call to Action*, the Johnson Foundation has been working on a number of fronts. Pat and a few other policy leaders returned to Wingspread in December to help Johnson evaluate options for next steps. Here are a few of the recent highlights that pertain to the Johnson Foundation endeavor:

- On May 24<sup>th</sup> the Foundation hosted a meeting of about 25 Coloradans at the Denver Museum of Nature and Science to scope out an approach for the upcoming Denver Regional Freshwater Forum. The Foundation is now laying the groundwork for the larger event to occur in the fall.
- The Foundation wants to do regional forums in two additional locations. They have tentatively selected Seattle as one of those venues, and are starting to line up conversations with key partners in the Seattle area with the hope of hosting a scoping meeting there in August.
- The Foundation is also moving forward with “Financing Sustainable Water Infrastructure” and “Agriculture, the Supply Chain, and Conservation Policy” policy meetings. Both will be held in Wisconsin this summer.

We continue to advocate with Johnson our desire to help host “on-the-ground” tours in the West, to help get some of more “ivory tower” Johnson participants more clued in to reality.

### **19. Irrigation Association (IA)**

The third annual Water Conference will take place July 21-22, at the Omni Interlocken Resort and Spa in Broomfield, Colo., a suburb of Denver. It is presented by the Irrigation Association in conjunction with the American Society of Irrigation Consultants. If you wish to attend, you need to register and book your hotel room at the Omni by June 1 to receive the IA discounted rate. Pat O'Toole, president of Family Farm Alliance, is one of the featured speakers at this conference, which will focus on the irrigation industry's role in solving today's water challenges.

## **20. AGree Advisory Committee**

AGree, a new initiative to transform food and agriculture policy, on June 23 announced the 29 members of its Advisory Committee, who will help shape and guide the direction of the initiative's strategy and objectives. Patrick O'Toole represented the Family Farm Alliance on the committee, which is seeking to find long-term, global food and agriculture policy solutions. The Advisory Committee is a core component of AGree's endeavor to change the current inertia on agriculture issues by engaging a broad array of stakeholders to develop solutions to improve agricultural productivity and environmental performance at the national and global levels; enhance availability of and access to nutritious foods; and promote opportunities for rural communities to succeed economically. The committee is composed of experts with diverse experience in their respective fields including farmers, ranchers, nutritionists, energy experts, environmentalists, scientists, technology developers, economists, business owners, international development veterans, and public health specialists. A list, bios and pictures of the AGree Advisory Committee members can be found on the AGree website:

<http://www.foodandagpolicy.org>

The initial meeting of the Advisory Committee took place in Minneapolis (MINNESOTA), which Pat attended. The Advisory Committee will provide key inputs that will help shape and direct AGree research topics and reports, discussion forums and policy recommendations — in coordination with the four co-chairs and a Research Committee. The Advisory Committee will meet several times a year with each other and the other AGree participants to discuss evolving problems and solutions in food and agriculture.

Pat noted that AGree leaders have striven to be very “judicial” in how this effort is being introduced to the public. He sees a common thread that ties many of the Advisory Committee members together: food security.

AGree is funded by Ford Foundation, Bill & Melinda Gates Foundation, The William & Flora Hewlett Foundation, W.H. Kellogg Foundation, The McKnight Foundation, The David and Lucile Packard Foundation, Rockefeller Foundation and The Walton Family Foundation.

## **21. Dispelling the Myths of Corporate Agriculture**

As previously reported, Bill Kahrl (Westlands Water District, CALIFORNIA) has been working with Huell Howser on a half-hour television program to be broadcast as part of his series for PBS. The objective is an educational program focusing on developments on the Westside of the San Joaquin Valley that illustrate how much agriculture on the Westside has changed. The idea is to present the public with a much richer and more detailed appreciation of the complexity, sophistication and environmental sensitivity of modern farming on the Westside. Huell will require assistance in underwriting the costs of the production -- \$15,000 overall. Sponsors will be identified on the program. The Alliance board of directors last year approved the Alliance as a sponsor, using the same arrangement we did on the IQA, where the Alliance would act as a “flow through” entity that would convey funds from West-side interests directly to Huell. We are

working with Bill Kahrl to prepare a 30-second presentation that will be included in the program to allow the Alliance to identify itself. This is an opportunity for us to deliver our own broader messages about our purposes and services we provide.

### **ADMINISTRATIVE AND MISCELLANEOUS**

- This year's summer tour hosted by the Four States Irrigation Council will be based out of the Holiday Inn Express in Concordia (KANSAS). For details and to view the schedule, go to: [http://4-states-irrigation.org/Summer\\_Tour\\_Kansas.html](http://4-states-irrigation.org/Summer_Tour_Kansas.html). Registration rate is \$85 (before July 31), \$100 (after July 31), which includes transportation, admission fees and meals.
- Pat O'Toole has been invited to speak on a panel of "national leaders" on the topic of "Water, Energy, and Rural Economic Development" at this year's Colorado Water Workshop at Western State College in Gunnison, July 20. This year's workshop - which has the theme of "Risk, Opportunity, and Leadership in Changing Climates" – will bring together a panel of national and regional leaders to focus on the opportunities associated with rural economic development for energy related to agriculture (e.g. biofuels, biomass, geothermal, small hydropower, wind and solar), including increased water and energy efficiency and opportunities for job creation, workforce and infrastructure development, and creating multiple revenue streams for rural communities.
- The Environmental Working Group (EWG) last week released the latest update of its widely referenced farm subsidy database. EWG insists that the new data reaffirm that you still don't have to be a farmer to collect federal farm subsidies. EWG Senior Vice-President Craig Cox, who sits on the AGree Advisory Committee with Pat O'Toole, caught an earful from Pat earlier this week after EWG propaganda found its way into the New York Times and CNN broadcasts on the same day.
- Farm Foundation, NFP will award a total of \$25,000 in small grants in its 2012 fiscal year. The maximum amount to be awarded per grant is \$5,000. Any projects funded must be non-advocacy in nature, and provide balanced, objective information. The Foundation's work focuses on six major areas: (1) Agriculture in the Environment, (2) Energy and Agriculture, (3) Food, Agricultural and Trade Policy, (4) Agricultural and Food System Productivity, Research and Technology, (5) Food Quality, Safety and Consumer Perceptions, and (6) Viability of Rural Regions. Proposed grants should address one of the Foundation's six program areas. **Applications for the Foundation's FY2012 grants are due July 1, 2011.** Responses will be issued August 15, 2011.

I appreciate all of the helpful input I have received from many of you in the past month. Please do not hesitate to contact me if you have any questions about this report.

**From:** Karen Clark

**Sent:** Thursday, July 14, 2011 10:35 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conf. Call Reminder

All,

This is a reminder that we'll have a PR/Legislation conference call tomorrow (Friday) at 7:30 a.m. PST. Let me know if you have any questions.

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Ed Manning  
**Sent:** Thursday, July 14, 2011 12:50 PM  
**To:** tbirmingham@westlandswater.org  
**Subject:** FW: Dinner on Monday Aug 1?

Tom: Do you have a few minutes to discuss logistics for DC? Dave wants to get us all together and I have to start main flight arrangements. Thanks.

**Ed Manning**  
**KP PUBLIC AFFAIRS**

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**From:** Dave Puglia [<mailto:DPuglia@WGA.com>]  
**Sent:** Thursday, July 14, 2011 11:53 AM  
**To:** Ed Manning  
**Subject:** DC: Dinner on Monday Aug 1?

Ed,

If possible, we should get our group (the Toms, you and me, Findaro, Bernhardt, plus Barbic and Cathy Enright of WGA DC office) together for dinner on Monday evening Aug. 1. Good chance to get our schtick down and build personal comfort level among people who haven't spent a lot of time with each other. Of course include Rubio if he's able.

Nassif and I land about 3:45 at Dulles on the 1<sup>st</sup>. Are you taking the United direct Sac to Dulles that day?

Let me know what you think.

Dave



**From:** Cindy Kao

**Sent:** Thursday, July 14, 2011 5:08 PM

**To:** Laura King Moon; Allison Febbo; Ara Azhderian; Becky Sheehan; bwalthall@kcwa.com; ccreel@kcwa.com; gzlotnick@h2oesq.com; jpeltier@westlandswater.org; Jim Fiedler; Joan Maher; Judy Bendix; Kurt Arends; Laura Simonek; Linda Standlee; vbarrio@mwdh2o.com; Peter Landreth; RPatterson@mwdh2o.com; Sheila Greene; sarakawa@mwdh2o.com; Taylor Blakslee; Terry Erlewine; tmberliner@duanemorris.com; Winn,Rochelle R

**CC:** Kear,Adam C; Valles,Sergio E; Frances Brewster

**Subject:** National conference on ecosystem restoration

**Attachments:** NCER 2011 conference FINAL\_AGENDA.pdf

FYI, attached is the agenda for the 4<sup>th</sup> national conference on ecosystem restoration (thanks Frances for bringing this to my attention). This was referenced in Recommendation 17 of the Review Panel Summary Report of the fall X2 experiment. A lot of these talks look interesting, including a panel discussion on "comparison and contrast of six large-scale ecosystem restoration programs", and a session on "Addressing Water Resources Challenges in the Sacramento-San Joaquin Bay-Delta." Too bad it's being held in Maryland. At any rate, this at least provides names of potential experts outside of the Bay Area that might be helpful in the future.

Cindy

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**From:** Laura King Moon [mailto:LauraK@swc.org]

**Sent:** Monday, July 11, 2011 4:42 PM

**To:** Allison Febbo; Ara Azhderian; Becky Sheehan; bwalthall@kcwa.com; Cindy Kao; ccreel@kcwa.com; gzlotnick@h2oesq.com; jpeltier@westlandswater.org; Jim Fiedler; Joan Maher; Judy Bendix; Kurt Arends; Laura King Moon; Laura Simonek; Linda Standlee; vbarrio@mwdh2o.com; Peter Landreth; RPatterson@mwdh2o.com; Sheila Greene; sarakawa@mwdh2o.com; Taylor Blakslee; Terry Erlewine; tmberliner@duanemorris.com; Winn,Rochelle R

**Cc:** Kear,Adam C; Valles,Sergio E

**Subject:** Tues. PRE meeting moved to Wed. for two hours from 9 to 11 am

This is to confirm that there will be NO PRE meeting tomorrow, and instead we will have a two hour meeting on Wednesday, from 9 to 11 am (call in 916.657.4110). Agenda for the Wed. meeting includes:

1. MOA revisions
2. Science review of Effects Analysis
3. Process for completion of terrestrial G&O objectives
4. Process for completion of aquatic G& O objectives
5. Outstanding concerns re Chapter 6
6. Process for getting closure on adaptive range
7. Concerns re new draft report by Fish Facilities Technical Team

Please let me know if you have other items.

*Laura King Moon*  
BDCP PRE Program Manager  
1121 L St., Suite 1050

Sacramento, CA 95814  
916/447-7357, ext. 206



4th National Conference on Ecosystem Restoration

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NCER 2011 Tentative Program Agenda

MONDAY	Monday, August 1, 2011
7:30am-5:30pm	Conference Registration Open (3rd Floor at top of Escalator)
7:30am	Morning Refreshments and Poster Session I Presenters & Exhibitors MOVE-IN to Set-Up Displays (Exhibit Hall - Grand Ballroom - 3rd Floor)
8:30am-12:00pm	OPTIONAL PRE-CONFERENCE WORKSHOPS (Consult the program book for meeting room locations if you registered for one of these workshops.)
12:00noon	Lunch on Own
1:00pm - 3:00pm	OPENING PLENARY SESSION (Harborside Ballroom - Level 4)  MODERATORS: Suzette Kimball, Deputy Director, US Geological Survey - and - Don Boesch, President, University of Maryland Center for Environmental Science (UMCES)  Plenary Speakers: Martin O'Malley, Governor, State of Maryland Kenneth Salazar, Secretary, Department of the Interior (invited) Benjamin Cardin, Senator, State of Maryland The Honorable Jo-Ellen Darcy, Assistant Secretary of the Army (Civil Works)
3:00pm	Refreshment Break (Exhibit Hall - 3rd Floor Grand Ballroom)

MONDAY	Monday, August 1, 2011 (continued)							
	Concurrent Sessions							
3:30pm-5:00pm	Challenges & Lessons Learned: Everglades, Louisiana Coastal Area and Great Lakes Restoration	Regulatory Pollution Diet for the Six-State Chesapeake Bay Watershed	Ecosystem Services: Integrating Ecology and Economics	Integration of Science and Engineering I	Coastal Habitat Restoration	Adaptive Management toward Restoration Objectives	Urban Ecosystem Restoration	Riverine Recovery
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Cheryl Ulrich	Richard Batiuk	Carl Shapiro	Ricardo Calvo	Robert Pace	Katelyn Lynch	Mark Jaworski	Chris Weber
AV Tech	Eliza Cava	Bronwyn Madeo	Don Hagan	Lewis Bush	Shae Luther	Ajay Sharma	Emily Rodriguez	Sean Sculley
3:30pm-3:40pm	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
3:40pm-4:00pm	Moderated Panel Discussion: Lessons learned related to improved cooperation at State and Federal levels in dealing with implementation and political challenges of large-scale restoration.	Gary Shenk - Components of the Chesapeake Bay TMDL	Stephen Faulkner - Integrated Modeling Framework for Forecasting Ecosystem Services	Jon Hendrickson - Island Construction-Rebuilding Natural Levees to Restore Hydrologic Connectivity	Bowdoin Lusk - Restoring Functional Oyster Reef Habitat in the Coastal Bays of Virginia	Andrew Tyre - Under What Conditions Might Ecologists Provide Evidence that Influences Decision Making?	Brian Murphy - A Past River for a Future Arizona – Salt River Environmental Restoration Project: Rio Salado Oeste Reach	Mark McKinstry - Recovering Endangered Fish in the San Juan River—Snatching Success From the Jaws of Nonnative Fish
4:00pm-4:20pm	Panel members: Kim Taplin (USACE WPB Deputy Program Manager for Restoration) Larry Gerry (SFWMD Chief Scientist & STA Issues Coordinator) Mark Wingate (USACE New Orleans Chief Projects Branch)	Jeni Keisman - Not All Loads Are Equal: Assigning Regional Pollutant Reductions in a Multi-State TMDL	Richard Bernknopf - Estimating the Supply of Ecosystem Services for a Carbon Resource Assessment	Mike Collis - Integration of Science and Engineering into Innovative Ecosystem Restoration Concepts for the CERP C-111 Spreader Canal Western Project	Robert Orth - Seed Addition Facilitates Eelgrass ( <i>Zostera marina</i> L.) Recovery in a Coastal Lagoon System (USA)	Jim Vearil - Use of Robustness and Flexibility in Adaptive Management for Addressing Uncertainty	John O'Meara - Improving an Urban Ecosystem for Recreational Uses: The Carpenter Lake Restoration Project	Charles Young - Case Study: Riparian Habitat Restoration for Improved Water Quality and Habitat in Highly Developed Suburban Watershed, West Whiteland Township Park, Exton, PA
4:20pm-4:40pm	Bren Haase (LA OCPR, Planning Section) Jan Miller (USACE ORD, Great Lakes Coordinator) and David Ullrich (Executive Director, Great Lakes and St. Lawrence Cities Initiative)	Katherine Antos - A Roadmap and Weigh Stations: Creating an Accountability System for Implementing a Multi-Jurisdictional TMDL in the Chesapeake Bay Watershed	Darius Semmens - Assessment of Goods and Valuation of Ecosystem Services (AGAVES) in the San Pedro River Basin, Arizona and Mexico	David Smith - Choosing One Stream Restoration Alternative Among Many	Morris Perot - Habitat Improvements to the Motor Island Shoreline in the Upper Niagara River, NY: A Collaborative Approach	Dan Salas - Urban Coastal Wetland Restoration Planning in America's Birthplace: Lessons from the John Heinz NWR and 300 Years of Urbanization	Jill Stachura - Urban Ecosystem Restoration: An Example of Stream and Lake Restoration in Metropolitan Atlanta, GA	Christopher Svendsen - Yellowstone River - Intake Dam Fish Passage and Entrainment Prevention
4:40pm-5:00pm		Jennifer Volk - Delaware's Role in Restoring the Chesapeake Bay	Jonathan Winsten - Increasing the Cost Effectiveness of Maryland's Cover Crop Program on the Eastern Shore	Larry Gerry - Everglades Stormwater Treatment Areas: Two Decades of Integrating Science and Engineering for Ecosystem Restoration	Eric Swain - Estimation and Prediction of Coastal Landscape Changes Utilizing a Hydrodynamic Simulator and Aerial Photogrammetry	Timothy Fleegeer - Big Muddy Metrics: Adaptive Management on the Missouri River	Mike Fowler - Comprehensive Watershed Planning for Nutrient Reduction in Ellerbe Creek, Durham, NC	Douglas Baughman - Chattahoochee River Dam Removal and Ecosystem Restoration Project: Meeting Ecosystem Restoration and Recreation Goals
5:00pm	PLENARY SOCIAL - The Future of NCER Join us for refreshments in Harborside Ballroom on the 4th Floor to discuss the Future of NCER.							
7:00pm - 9:00pm	Welcome Reception at the National Aquarium in Baltimore (Participants will walk to the nearby Baltimore Aquarium for a beautiful evening in aquatic surroundings.)							

TUESDAY	Tuesday, August 2, 2011							
7:30am-5:30pm	Conference Registration Open							
7:30am-8:30am	Morning Refreshments in Exhibit Hall (Grand Ballroom - 3rd Floor)							
8 30am-10:00am	<b>Plenary Session – Restoration Priorities</b> (Harborside Ballroom - Level 4)  <b>MODERATOR: Don Boesch</b> , President, University of Maryland Center for Environmental Science (UMCES)  <b>Plenary Speakers:</b> <b>The Honorable Robert Graham</b> , Former Senator, State of Florida <b>Barry Gold</b> , Program Director, Marine Conservation Initiative, Gordon & Betty Moore Foundation <b>Larry Schweiger</b> , President and Chief Executive Officer, National Wildlife Federation							
10:30am	AM Break in Exhibit Hall (Grand Ballroom - 3rd Floor)							
	Concurrent Sessions							
10:30am-12:00noon	Establishing Successful Science/Policy Linkages	Climate Change Impacts on Chesapeake Bay Restoration	Principles and Guidelines for Water Resources Planning and Implementation	Governance and Management Decision Making	USDA NRCS Mississippi River Basin Healthy Watershed Initiative	Our Resilient Waterways: Balancing Urban Growth While Maintaining Sustainable Ecosystems	Lake Restoration	Incorporating Invasive Species Management in Ecosystem Restoration
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Matt Harwell	Kevin Sellner	Dave Tazik	Dennis Kamber	Danielle Flynn	Andrew LoSchiavo	Chris Ross	Bill Zattau
AV Tech	Helena Gomes	Shannon Philbin	Steve Loughry	Don Hagan	Emily Rodriguez	Thea Hotaling	Katelyn Lynch	Innocent Onnah
10:30am-10:40am	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
10:40am-11:00am	Matt Harwell & John Ogden - This session addresses the issue of establishing successful linkages between policy and science in restoration efforts. A panel of experts involving both	Raymond Najjar - Potential Climate Change Impacts on the Chesapeake Bay	Robyn Colosimo, PE, Deputy Associate Director of Natural Resources, Council on Environmental Quality, will address the process of revising the P&G; policy, science and	Pervaze Sheikh - Implementation and Governance of Large-Scale Ecosystem Restoration Initiatives: A Congressional Perspective	Thomas Christensen - Overview of the Mississippi River Basin Healthy Watersheds Initiative (MRBI)	Wolfgang Wolter- Balancing Competing Priorities in an Urban Creek Restoration in Toronto Ontario Canada	Andrew Hannes - Benthic Ecological Assessment for the Great Lakes Method	Matthew Shanks - Interagency Monitoring of Bighead and Silver Carp in the Upper Illinois River and Chicago Area Waterways
11:00am-11:20am	scientists and policy makers will 1) discuss current challenges seen in restoration practices; 2) explore proposed mechanisms to improve linkages; and 3) outline next	Robert Wood - Using Historic Analogy to Evaluate How Future Climate Changes May Affect Chesapeake Bay and its Restoration Trajectory	engineering issues, and emerging procedural guidelines and methodologies; P&G background, principles of modernization, an overview of the process, public comment perspectives,	Igor Linkov - Decision Analysis and Ecosystem Restoration: Framework and Application Case Studies	Robert Kellogg- The Effects of Conservation Practices on Environmental Quality in the Upper Mississippi River Basin	David Gorman- Lower Columbia River Pile Dike Assessment	Tim Fobes - Improving NEPA Alternatives Documentation for Objective Decision Making in Ecosystem Restoration and Endangered Species Recovery on the Missouri River: The	Dave Wethington - The Great Lakes & Mississippi River Interbasin Study (GLMRIS)
11:20am-11:40am	steps beyond NCER dialogue, followed by structured Q&A.	William Stiles - Developing a “Toolkit” for Climate Change Adaptation in Virginia’s Tidal Shoreline Communities	writing and vetting; she will also present results to date and status of the signed P&G, and applicability and guidelines under public review. Audience Q&A will follow.	Kenneth Mierzwa - Restoration Policy: A City Council Perspective	Mike Sullivan - A Progress Report for Mississippi River Basin Healthy Watersheds Initiative Implementation in Arkansas	Kathryn Barnicle- Ups and Downs of a Salt Marsh Restoration Project in an Urban Setting	Carla Duncan - Lake Rehabilitation Options for the Machado Lake Ecosystem Rehabilitation Project	Jon Lane - Everglades Restoration, Swamped by Invasive Species
11:40am-12:00noon		Gary Shenk - Downscaled Regional Climate Models and Future Chesapeake Bay Loads		Jessica Weatherby - How to Proceed with Restoration Construction When Agricultural Chemicals Pose Ecological Bioaccumulation Concerns	Trey Cooke - Mississippi River Basin Healthy Watersheds Initiative: Impacts in the Yazoo Basin	Steve Wolf- Balancing the Development and Maintenance of Waterways with Ecosystem Protection and Restoration	Nick Jokay - Geomorphological Interpretation of High Resolution DEMs from the GIS Desktop: A Case Study	Ondrea Hummel - Invasive Species Management in the Southwestern United States
12noon - 1:30pm	Lunch on Own							

TUESDAY	Tuesday, August 2, 2011 (continued)							
1:30pm - 3:00pm	Comparison and Contrast of Six Large-scale Ecosystem Restoration Programs	Lessons Learned and New Opportunities for Restoring Water Quality in Chesapeake Bay	Approaches to Environmental Benefits Assessment	Integration of Science and Engineering II	Ecosystem Restoration with Private Landowners through Partnerships	Decision Support Tools to Establish Restoration and Preservation Priorities	Restoring the New York Harbor Estuary	Invasive Species
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Brad Thompson	Peter Tango	David Escude	Tim Feather	Philip Barbour	David Hanson	Lisa Baron	Dave Koran
AV Tech	Steve Loughry	Bronwyn Madeo	Ajay Sharma	Sean Sculley	Thea Hotaling	Eliza Cava	Helena Gomes	Don Hagan
1:30pm-1:40pm	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
1:40pm-2:00pm	This session provides a forum for comparison and contrast of a number of the nation’s largest ecosystem restoration efforts.  -Chesapeake Bay Program - <b>Frank Dawson</b> -Coastal Louisiana Area - <b>Greg Miller</b> -Everglades Restoration - <b>Stu Appelbaum</b> -Missouri River Recovery Program - <b>Brad Thompson</b> -California Bay Delta - <b>Tom Kendall</b> -Upper Mississippi River - <b>Ken Barr</b>	<b>Denice Wardrop</b> - Water Quality Challenges in the Chesapeake Bay – The Science Dimension	<b>Barbara Cintron</b> - Calculating Environmental Benefits: Goals, Performance Measures, Performance Targets and Habitat Units	<b>Eliza Hines</b> - The Real World – Merging Science and Engineering for Ecosystem Restoration	<b>Danielle Flynn</b> - NRCS National Sage Grouse Initiative: Focused Working Lands Conservation	<b>Joe DePinto</b> - Evolution of Modeling Tools to Support Management and Restoration of the Great Lakes	<b>Peg McBrien</b> - Urban Wetland and Stream Restoration in the Hudson-Raritan Estuary	<b>Alfred Cofrancesco</b> - Restoration of Wetland Habitats Dominated by <i>Phragmites australis</i>
2:00pm-2:20pm		<b>Rich Batiuk</b> - Putting the 17 Million Chesapeake Bay Watershed Residents on a Regulatory Pollution Diet	<b>Bruce Pruitt</b> - Development and Application of a Piedmont Stream Conceptual Model	<b>Wendy Katagi</b> - Restoration Opportunities Spurred by Steelhead Recovery in Southern California	<b>Dale Humburg</b> - Wetland Restoration on Private Lands: Changing Perspectives and Future Challenges	<b>Willis McConnaha</b> - Use of a Medical Model to Diagnose and Treat Ecological Systems	<b>Terry Doss</b> - Restoring Coastal Habitat in the Heart of New York City	<b>Mark Lewandowski</b> - Management Strategies for Water Chestnut ( <i>Trapa natans</i> ): A Historical Perspective
2:20pm-2:40pm		<b>Scott Phillips</b> - Applying Adaptive Management to Improve Water-Quality Decision Making: Implications for Restoring the Nation’s Largest Estuary- Chesapeake Bay	<b>Joe Berg</b> - Prioritizing Watershed Restoration: Headwater versus Downstream Projects	<b>Wayne Nelson-Stastny</b> - Development of the Natural Resource Baseline Assessment for the Missouri River Ecosystem Restoration Plan	<b>Trey Cooke</b> - Partnerships Driving Ecosystems Restoration on Private Lands in the Yazoo Basin	<b>Denise Reed</b> - Using Science to Inform Decision Making in the Face of Uncertainty: A Tool for Prioritizing Coastal Restoration and Protection Projects in Louisiana	<b>Roy Messaros</b> - The Sustainability of a Tidal Salt Marsh Restoration Effort in Jamaica Bay, New York	<b>William Holman</b> - Applying Engineering Solutions to the Science of Invasive Aquatic Species Control – Asian Carp and Sea Lamprey
2:40pm-3:00pm		<b>Vicki Blazer</b> - Toxic Chemicals and Fish Health in Chesapeake Bay	<b>Larry Schwartz</b> - Evaluation of Environmental Benefits for the Louisiana Coastal Area (LCA) Small Diversion at Convent/Blind River Project	<b>Daniel Baker</b> - Incorporating Decision Analysis and Predictive Design into Stream Restoration: The Stream Project	<b>Wes Burger</b> - Ecosystem Restoration Efforts on Private Lands: The Role of Farm-scale Planning and Delivery	<b>Panel Discussion</b>	<b>Chris Cotroneo</b> - Harvesting Macroalgae as a Means of Reducing Nutrients in Jamaica Bay, New York City	<b>David Bauman</b> - Managing Invasive Plant Species in the Picayune Strand Restoration Project, Southwest Florida
3:00pm	PM Break							
3:30pm-5:00pm	<b>Restoration Coffee House Plenary Session on Chesapeake Bay</b> (Harborside Ballroom - Level 4)  <b>MODERATOR: Tim Wheeler, Reporter, The Baltimore Sun</b>  <b>Coffee House Panelists:</b> <b>Jeff Corbin</b> , Special Assistant to EPA Administrator—Chesapeake Bay Program <b>Will Baker</b> , President, Chesapeake Bay Foundation <b>Ann Pesiri Swanson</b> , Executive Director, Chesapeake Bay Commission <b>Robert Summers</b> , Secretary of the Environment, Maryland Department of the Environment							
5:00pm - 6:00pm	<b>Plenary "Listening Session" with State &amp; Federal Agency Representatives</b> (This session will elicit feedback from stake-holders, cooperators and agency representatives as part of a "restructuring" of USGS mission areas by the Ecosystem Science Strategy Planning Team.)							
6:00pm-8:00pm	<b>Poster Session I and Networking Reception in the Exhibit Hall</b> (Grand Ballroom - 3rd Floor)							

WEDNESDAY	Wednesday, August 3, 2011							
7:00am-1:00pm	Conference Registration Open							
7:00am-8:00am	Morning Refreshments in Exhibit Hall (Grand Ballroom - 3rd Floor)							
8:00am-9:30am	Ecosystems of National Significance	Chesapeake Bay Oyster Restoration under the Executive Order	Natural Resource Damage Assessment and Restoration Session 1	Louisiana Coastal Restoration & the Louisiana Coastal Area (LCA) Projects	Building with Nature: Combining Ecological and Economic Interests	The Baltimore Watershed Agreement: An Interjurisdictional Approach to Watershed Restoration	Managing the Science of Everglades Restoration	Water Quality Nutrients, Contaminants and Sustainable Sediment Management
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Roselle Henn	Bruce Vogt	Michael Hooper	Mark Wingate	Barry Dubinski	Nicole Stern	Gretchen Ehlinger	Wendy Sotera
AV Tech	Katelyn Lynch	Thea Hotaling	Sean Sculley	Lindsay Dunaj	Ajay Sharma	Dillion Asher	Shae Luther	Don Hagan
8:00am - 8:10am	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
8:10am - 8:30am	James Edward - Vision for Protecting and Restoring the Chesapeake Bay Watershed Restoration and Measuring Success	Bruce Vogt- Collaborative Approach to Bay Oyster Restoration	Steve Glomb - Overview of Natural Resource Damage Assessment and Restoration	Darrel Broussard - Coastal Restoration and Louisiana Coastal Area (LCA) Overview, US Army Corps of Engineers	Huib de Vriend - Building with Nature: Nature Beyond Restoration	Nicole Stern - An Introduction to the Baltimore Watershed Agreement Action Plan	Dave Tipple - Interagency Scientific Oversight of Everglades Restoration: RECOVER Ten Years Later	Zhonglong Zhang - Development of SWAT Models to Quantify Sediment and Nutrient Losses from Missouri and Upper Mississippi River Basins
8:30am-8:50am	Kelly Baxter- Osborne - Puget Sound Nearshore Ecosystem Restoration Project: Defining Restoration Vision and Measuring Success	Angela Sowers- Chesapeake Bay Oyster Restoration: The USACE Perspective - Past, Present and Future	Kristin Skrabis - The Role of Economics in the Natural Resource Damage Assessment and Restoration Process	Bren Haase - Louisiana Coastal Restoration and LCA Overview, State of Louisiana’s Perspective	Karin Krchnak - Effective Partnering to Advance Integrated River Basin Management	Steven Stewart - The Baltimore Watershed Agreement: Challenges & Successes of Collaborative County, City, & NGO Monitoring Efforts	Fred Sklar - A Conceptual Ecological Model for Everglades Tree Islands	John Brakebill - Supporting Chesapeake Bay Restoration by Modeling Nutrient and Sediment Sources and Transport
8:50am-9:10am	Peter Weppler - Restoration Planning for the Hudson-Raritan Estuary – An Example of Collaboration	Eric Weissberger- Maryland's Role in Chesapeake Bay Oyster Restoration	Janet Whitlock - The Nexus Criterion: Linking Resource Injuries to Restoration Projects	Natalie Snider - Disconnect Between Restoration Planning And Restoration Needs: Advocating a Different Timeline	Kevin Brennan and Mark Mendelsohn - Remote Island Restoration in the Chesapeake Bay Through the Beneficial Use of Dredged Material	Duncan Stuart - Baltimore Watershed Agreement (BWA): Challenges & Successes of Collaborative Planning	Susan Kemp - Setting Salinity Targets for Restoration in South Florida’s Estuaries	William Orem - Sulfate as a Contaminant in Freshwater Ecosystems – Sources, Impacts and Mitigation
9:10am-9:30am	Susan Rees - Gulf Coast Restoration Mississippi Style: Achieving the Philosophy of the Gulf of Mexico Alliance through Mississippi Coastal Improvement Program	Howard Townsend- The Oyster Data Tool: Compiling State and Federal Oyster-related Data into a Single Database	Molly Spurduto - Benefits of Monitoring Common Loon Restoration Following the North Cape Oil Spill	Barbara Kleiss - Promoting Science-based Decisions: The Louisiana Coastal Area (LCA) Science and Technology (S&T) Program	Alex Brunton - Analysis of Flooding and Sediment Transport by Numerical Modeling as Part of the Don River Mouth Naturalization Project, Toronto	Nancy Pentz - BWA: Challenges and Successes of Collaborative County, City, and NGO Public Outreach and Awareness Efforts	Agnes McLean - Adaptive Management in Everglades Restoration: Decompartmentalization of Water Conservation Area 3	Nicholas Albergo - Latex Recovery and Process Water Treatment, Liberia, West Africa
9:30am-10:00am	AM Break om the Exhibit Hall (Grand Ballroom - 3rd Floor)							



WEDNESDAY	Wednesday, August 3, 2011 (continued)							
10:00am-11:30am	Facilitating Environmental Restoration through the Application of Ecosystem Services	Local, District and State Government Contributions to Chesapeake Bay Ecosystem Restoration	Natural Resource Damage Assessment and Restoration Session 2	Louisiana Coastal Restoration	Overcoming Institutional Barriers for Effective Implementation of Adaptive Management	Ecosystem Restoration Program Management and Large Scale Project Management I	Ecosystem Restoration and Large-Scale Project Implementation: The Ohio River Basin	Use of Remote Sensing and Mapping in Ecosystem Restoration
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	David Moore	Andrea Ryon	Susan Kennedy	Rob Daoust	Tom St Clair	Eric Hughes	Beth Cade	Joanne Chamberlain
AV Tech	Don Hagan	Bronwyn Madeo	Innocent Onnah	Ajay Sharma	Eliza Cava	Shae Luther	Thea Hotaling	Shannon Philbin
10:00am-10:10am	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
10:10am-10:30am	Lisa Wainger - Measuring Economic Benefits of Restoration for Spatial Targeting and Ecosystem Service Trades or Offsets	Pete Hill Stormwater Management and Habitat Restoration for the Benefit of the District of Columbia and the Bay	Jennifer Hill-Kelley - Assessment and Restoration of Tribal Cultural Resources	Yvonne Allen - Using Systemwide Assessments of Habitat Condition in the Atchafalaya Basin to Identify and Evaluate Management Improvements	Kenneth Barr - Towards Effective Adaptive Management on the Upper Mississippi River System	Megan Roessing - An Overview of the Collaborative Forest Landscape Restoration Program	Beth Cade - Watershed Planning for Restoring Sustainable Ecosystems in the Ohio River Basin	Raul Mercado - HyperSpectral / LIDAR/RADAR Imagery for Water Quality Monitoring and Environmental Assessment in Ecosystem Restoration
10:30am-10:50am	Wayne Munns- Improving Hazardous Waste Site Remediation and Restoration Decisions Using Ecosystem Services	Ken Pensyl Maryland Stormwater Act and Watershed Implementation Plans	Michael Hooper - Confronting Climate Change through Restoration - Department of the Interior NRDAR Program	Melissa Kenney - Integrating Delta Building Physics & Economics: Optimizing Engineered Avulsions in the Mississippi Delta	Craig Fleming - Organizational Restructuring has Facilitated Implementation of AM for MRRP	Betty Dehoney - Bay Delta Conservation Plan	Rob Simmonds - The Ohio River Basin Fish Habitat Partnership and Aquatic Ecosystem Restoration	Lawrence Spencer - Responses of Floodplain Wetland Vegetation to Kissimmee River Restoration Project Phase I
10:50am-11:10am	Matthew Wartian - Role of Ecosystem Services in Habitat Equivalency Analysis	Uwe Kirste Watershed Management Planning in Prince William County, VA	Bruce Bayne - A Company Perspective on Cooperative Assessment and Restoration: A Case Example from a CERCLA Site	Jason Farmer - Ecosystem Planning at Warp Speed: The LCA Medium Diversion at White Ditch Story	Andy LoSchiavo - Everglades Restoration AM Program: Challenges and Solutions	David Galat - Great Rivers that Work for People and Nature	John Stark - The Nature Conservancy's Ecosystem Strategies and Objectives for the Ohio River Basin	Holly Beck - Accessing Biophysical Signatures in Remote Sensing Data to Inform Eco-hydromorphic Characterization of the Louisiana Coastal Landscape
11:10am-11:30am	Steve Gruber - Role of Ecosystem Services in Watershed Management	Jeff Perry Planning for Chesapeake Bay TMDL Implementation in Henrico County, VA	John Schmerfeld - Restoration Options for Neotropical Birds: A Look Toward the Future	Lawrence Haase & Lucila Silva - Louisiana Coastal Restoration and Protection Planning Strategies: Projects to Implementation	Jennifer Pratt Miles – Designing Collaborative Approaches for Effective Adaptive Management	Christopher McVoy - The River of Grass Paradigm: Everglades Restoration Planning through Model-Assisted, Interactive Public Engagement	Richard "Gus" Drum - Using Section 729 Watershed Assessments for Ecosystem Restoration in the Ohio River Basin	Amanda Oliver - Bathymetric Data and Aerial Photography Provide Insight into Five Decades of Lower Mississippi River Side Channel Change
10:30am - 11:30am	<b>Board Buses for Optional Field Trips</b> (Some trips to distant locations must depart earlier. Consult the program book for a detailed boarding schedule for each trip. Feel free to check with the registration staff to see if there are vacancies.)							
11:30am-7:00pm	Afternoon on Own for Field Trips, Ad Hoc Meetings or Networking							



THURSDAY	Thursday, August 4, 2011							
7:30am-5:30pm	Conference Registration Open							
7:30am-8:30am	Morning Refreshments in the Exhibit Hall (Grand Ballroom - 3rd Floor)							
8:30am-10:00am	<b>Plenary Session - Linking Land and Ocean</b> (Harborside Ballroom - 4th Floor)							
	<b>MODERATOR: Suzette Kimball, Deputy Director, US Geological Survey</b>							
	<b>Plenary Speakers:</b> <b>Larry Robinson</b> , Assistant Secretary for Commerce for Oceans and Atmosphere, NOAA <b>Kameran Onley</b> , Director of US Marine Policy, The Nature Conservancy <b>Dave White</b> , Chief, USDA Natural Resources Conservation Service (NRCS)							
10:00am-10:30am	AM Break in the Exhibit Hall (Grand Ballroom - 3rd Floor)							
	Implementation and Political Challenges to Ecosystem Restoration	Assessing Ecosystem Service Benefits of Ecosystem Restoration and Management	Planning and Design for Climate Change Impacts: Ebb and Flood	Implementing Restoration: Progress in the Light of Process	Ecosystem Restoration Program Management and Large-Scale Project Implementation	Real Estate Challenges Within Large Scale Ecosystem Restoration Programs	Resilience of Integrated Coastal Systems	Instream and Freshwater Inflow Development
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Scott Slocum	Dennis King	Karen Appell	Casey Kruse	Brian Files	Chuck Padera	S. Kyle McKay	Laura Stroup
AV Tech	Steve Loughry	Helena Gomes	Lewis Bush	Dillion Asher	Innocent Onnah	Bronwyn Madeo	Shannon Philbin	Lindsay Dunaj
10:30am-10:40am	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
10:40am-11:00am	<b>Eliza Cava</b> - Evolution of an Idea and an Institution: Assessing Army Corps of Engineers Progress in Large-Scale Ecosystem Restoration in the Florida Everglades	<b>Todd Gartner</b> - Using Incentives to Connect Forests, Water, and Communities in the Northeast United States	This session features presentations by multi-disciplinary experts followed by Q&A.  <b>PANELISTS:</b> <b>Art Miller, Christine May, Helen K.C. McMillan, Bethany Bearmore, Robert Esenwein, Peter Weppler &amp; Peter Wijsman</b>	<b>Mary Roth</b> - Challenges of Stakeholder Engagement in the Missouri River Recovery Program	<b>Storm Cunningham</b> - Designing, Funding, Implementing and Managing Large-scale, Long-term Ecosystem, Watershed and/or Fishery Restoration Programs	<b>Sharon Conklin</b> - Relocating a Way of Life	<b>Kyle McKay</b> - Assessing Resilience of Coastal Ecosystems	<b>Denise Reed</b> - How Much Flow is Enough? Contrasting the Role of Riverine Inputs in Estuarine Ecosystem Restoration in California Bay-Delta and the Mississippi Delta
	<b>Eric Bush</b> - Managing Implementation of an Ecosystem Restoration Program	<b>Leslie Richardson</b> - Benefit Transfer and Visitor Use Estimating Models of Wildlife Recreation, Species and Habitats	*Planning for the Impact of Climate Change for FEMA’s National Flood Insurance Program  *Adapting to Rising Tides: San Francisco Bay Area Climate Change, Vulnerability, and Risk Assessment	<b>Gretchen Ehlinger</b> - Working with FACA - Challenges to Large Scale Ecosystem Restoration Programs	<b>Kevin O'Donnell</b> - Integration of Existing EPA Authorities and New Restoration Efforts to Accelerate Recovery of Areas of Concern in the Great Lakes Basin	<b>Willie Patterson</b> - Real Estate Acquisition: Post Hurricane Katrina	<b>Bhaskaran Subramanian</b> - Enhancing Coastal Resilience with Integrated Planning by the State of Maryland	<b>Danielle Kreeger</b> - Importance of Freshwater Inflow for Natural Resources of the Lower Delaware River Basin and Estuary
11:20am-11:40am	<b>Jed Redwine</b> - Where Should We Act and at What Scale? Defining the Meaning of Restoration from an Ecological Perspective	<b>Katherine von Stackelberg</b> - A Systematic Review of Ecosystem Services from Green Space	*Addressing Sea Level Rise Impacts on Tidal Wetland Restoration Projects: Development of NOAA Design	<b>Kim Dryden</b> - Picayune Strand Restoration Project in Southwest Florida: A Landscape Perspective and Interagency Effort	<b>Dan Miller &amp; Marvin Hubbell</b> - Environmental Restoration on the Upper Mississippi River System: The USACE/Contractor Relationship	<b>Matt Krajewski</b> - Federal Mandates and Willing Sellers: Real Estate Acquisition for the Missouri River Recovery Program	<b>Leslie Suazo</b> - Resilience in Coastal Louisiana	<b>Shae Luther</b> - The Importance of Reuse Water in Instream and Freshwater Inflows: the Case of Texas
	<b>Jim Henderson</b> - Ecosystem Services and the Corps of Engineers: Now that We’ve Identified Them, We’re Figuring Out What to Do	<b>Kathy Anderson</b> - Environmental Benefits of an Urban Stream Restoration	Guidance and Potential Applications	<b>Greg Miller</b> - Effective Public Involvement Strategies for Restoration Planning	<b>Orlando Ramos-Gines</b> - Maximizing Learning and Successes of Fast-Paced Large-Scale Projects While Adapting Bureaucratic Processes and Practices	<b>Bruce Sackett</b> - Platte River Recovery Implementation Program: Real Estate Methods of a Willing Buyer Willing Seller Acquisition Program	<b>Craig Fischenich</b> - A Framework for Adaptively Managing Restoration Projects in Coastal Louisiana	<b>Paul Conrads</b> - Analyzing the Effects of the Hydroelectric Plant Releases on the Hydrology of the Congaree National Park Floodplain, South Carolina
12noon - 1:30pm	LUNCH ON OWN							

THURSDAY	Thursday, August 4, 2011 (continued)							
1:30pm3:00pm	Making Adaptive Management Meaningful – Bridging the Science / Decision-Making Gap	Addressing Water Resources Challenges in the Sacramento – San Joaquin Bay-Delta	Restoration Efforts on Private Lands	Legal Issues in Ecosystem Restoration	Stakeholder Engagement and Perspectives	Integrating Long-term Proxy Records of Sea-level Rise and Climate Change into Planning	Foundations for Large River Restoration Planning	Dam Removal: The Goldilocks Approach
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Chad Smith	Cindy Tejeda	Erik Meyers	Phil Steffen	Beverly Getzen	Debra Willard	Robert Pace	Serena McClain
AV Tech	Eliza Cava	Lewis Bush	Helena Gomes	Lindsay Dunaj	Shae Luther	Katelyn Lynch	Steve Loughry	Emily Rodriguez
1:30pm-1:40pm	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
1:40pm-2:00pm	Ernest Clarke - Bridging the Science / Decision-Making Gap in the Trinity River Restoration Program	Chip Smith - Proactive Solutions for America’s Water Resources Needs: Planning for Tomorrow’s Challenges	Katherine Basiotis - Protecting the Chesapeake Bay: Voluntary Projects on Private Lands	Mark Shafer - Ecosystem Restoration on Former Agricultural Lands: The CERP and Evolving Corps HTRW Policy	Susan Testroet-Bergeron - Exercising Various Techniques to Engage the Public in Louisiana’s Coastal Restoration	Laura Brandt - Reconstructing Vegetation Response to Altered Hydrology and its Use for Restoration - Arthur R. Marshall Loxahatchee National Wildlife Refuge	Robert Jacobson - Conceptualizing and Communicating Ecological River Restoration	Jennifer Bountry - Guidelines for Assessing Sediment-related Effects of Dam Removal
2:00pm-2:20pm	Dennis Kubly - The Intersection of Science and Decision Making in the Glen Canyon Dam Adaptive Management Program	Paul Robershotte - A Systems Framework for the Bay-Delta: A Regional Perspective	Frank Casey - Implementing Landscape Conservation Cooperatives: Science and Policy Implications of Payments for Ecosystem Services Programs	Herman Jarboe - Legislative Drafting Service Fundamentals for Ecosystem Restoration Projects	Karla Sparks - Innovative Methods for Incorporating Tribal Natural Resource Information into the Missouri River Ecosystem Restoration Plan	Ellen Thomas - Long Island Sound: Relative Sea Level Rise over the Last Millennium	John Nestler - The River Machine: A Conceptual Model for Large Rivers Integrating Fish Movement and Habitat, Fluvial Geomorphology, Fluid Dynamics and Biogeochemical Cycling	Adam Pearson - Geomorphic Response of the Souhegan River to the Removal of the Merrimack Village Dam
2:20pm-2:40pm	Kent Loftin - The Science-Decision Making Interface of the Kissimmee River Restoration Program	Brooke Schlenker and Ed DeMesa - Integrated Flood Risk Management and Ecosystem Restoration on McCormack-Williamson Tract	Anthony St. Aubin - Skokie River Woods Wetland Restoration and Enhancement Project	Cheryl Ulrich - Endangered Species Act’s Implementation Challenges to Large Scale Ecosystem Restoration Programs	Kelly Brennan - The Importance of Stakeholder Involvement in Small Watershed Action Plans & Maintaining Stream Health	Lynn Wingard - Potential Impacts of Climate Change and Sea Level Rise on South Florida’s Coastal Wetlands	Kelly Burks-Copes - Ecosystem Modeling for the Missouri River Cottonwood Management Plan	Mary Andrews - Designing and Implementing Dam Removal Projects in the Context of the Regulatory Climate: The Simkins Dam Removal Case Study
2:40pm-3:00pm	David Marmorek - What Determines Whether or Not Adaptive Management Programs Affect Management and Policy Decisions?	Gary Bardini - Integrated Sustainable Water Management for California: Addressing Current Physical and Institutional Challenges to Meeting Future Needs	Jeffrey Lee - Valley Creek Watershed and Stream Restoration	Richard Grosso - My Perspective on Top Legal Issues in Ecosystem Restoration <i>(invited)</i>	Cynthia Wood - The NRCS/USACE Partnership Handbook: A Field Guide to Working Together Toward Shared Goals	Christopher Bernhardt - Marl Prairie Vegetation Response to 20th Century Land Use and its Implications for Management in the Everglades	John Nestler - Reference Condition Approach to Large River Restoration Planning	Mathias Collins - Improving Implementation and Effectiveness Monitoring at Dam Removal Sites and their Integration with Project and Program Planning
3:00pm	PM Break in Exhibit Hall (Grand Ballroom - 3rd Floor)							
3:30pm	<p><b>Restoration Coffee House Plenary Session on Communication in Ecosystem Restoration</b></p> <p><b>MODERATOR: Terence Smith, PBS Award-winning Journalist</b></p> <p><b><u>Coffee House Panelists:</u></b>  <b>Tom Horton, Author</b>  <b>Chris Mooney, Freelance Writer</b>  <b>David Fahrenthold, The Washington Post</b>  <b>Christopher Joyce, National Public Radio</b></p>							
5:30pm-7:30pm	<p><b>Poster Session II and Networking Reception in the Exhibit Hall</b>  (Grand Ballroom - 3rd Floor)</p>							

FRIDAY	Friday, August 5, 2011							
7:30am-1:00pm	Conference Registration Open							
7:30am-8:30am	Morning Refreshments in the Exhibit Hall (Grand Ballroom - 3rd Floor)							
8:30am-10:00am	Climate Change and Restoration	Pieces of the Puzzle: Restoring the Chesapeake Bay Ecosystem	Management Aspects of Large Scale Ecosystem Restoration	Environmental Benefit Justification on Ecosystem Restoration Projects	Great Lakes Restoration Initiatives and Approaches	Aquatic Habitat Restoration and Adaptive Management in Southwest U.S.	Estuarine Ecosystems Restoration	Dam Removal
	Harborside A & B 4th Floor	Harborside D & E 4th Floor	ESSEX 4th Floor	Laurel 4th Floor	Kent 4th Floor	Dover 3rd Floor	Waterside A Lobby Level	Waterside B Lobby Level
Moderator	Glenn Landers	Rich Batiuk	Peyton Robertson	Susan Conner	Joe Pfeiffer	N. Kennedy & L. Skaggs	Scott Phillips	Heather Day
AV Tech	Lewis Bush	Steve Loughry	Dillion Asher	Helena Gomes	Sean Sculley	Shannon Philbin	Innocent Onnah	Lindsay Dunaj
8:30am - 8:40am	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview	Introduction & Overview
8:40am - 9:00am	Matthew Goldman - Mitigation, Adaptation, Resilience: The Evolving Role of Climate Change in Restoration	John Shuman - A History of Agricultural BMPs in the Octoraro Creek Watershed and Associated Nutrient Load Reductions to Chesapeake Bay	Todd Hopkins - Landscape Conservation Cooperatives: Working Together to Sustain America’s Land, Water, Wildlife and Cultural Resources	Brad Foster- Tamiami Trail: Comparison of Ecological Benefit Methods Used by Different Federal Agencies	Mike Greer - US Army Corps of Engineers Role in the Great Lakes Ecosystem Restoration Initiative	Ondrea Hummel - Evaluating Restoration Success and Applying Adaptive Management in the Middle Rio Grande Bosque	Laura Lee Wilkinson & Lee Walker - Planning Hurricane Storm Damage Risk Reduction: Minimizing Impacts to Lake Pontchartrain	David Huntress - “Natural” Riverine Recovery Following Dam Removal
9:00am - 9:20am	Cindy Barger - Thinking Ahead: Incorporating Climate Change into Aquatic Ecosystem Restoration Planning for the Ala Wai Watershed Project	Rebecca Golden - Maryland’s Large-scale Eelgrass ( <i>Zostera marina</i> ) Restoration: A Retrospective Analysis of Techniques, Costs and Monitoring	Sarah Miller- Defining the Spatial and Temporal Extent of Ecosystem Restoration Project Environmental Benefits	Richard Cole - A Case Study Comparison of Two Indices for Ranking Ecosystem Restoration Projects Based on National Benefit	Burton Suedel - Concept and Approaches for Adding Environmental Enhancements to Great Lakes Breakwaters and Jetties	Daniel Artho - Ecosystem Restoration on the Truckee River, Nevada: Integrating Ecosystem Restoration with Flood Risk Management in High-desert Landscape	David Gorman - Wapato Access Feasibility Study: Restoring Columbia River Salmonid Rearing Habitat	Shane Cline - Gold Ray Dam Removal – Removal of the Last Fish Barrier on the Lower Rogue River
9:20am - 9:40am	Randy Davis - Wildland Forest Soil Carbon Management	Sharon Madden - Environmental Management at DoD Facilities in the Chesapeake Bay Region	Brian Mastin - Bioremediation’s Integral Role in Ecosystem Restoration and Rehabilitation	Joe Berlin - Estimating Recreational Benefits from Coastal Restoration Projects in Louisiana	Don Schloesser- Restoration of Burrowing Mayflies ( <i>Hexagenia spp.</i> ) in the Laurentian Great Lakes	Thomas Keeney - Endangered Species Ecosystem: Striking a Balance Using Flood Risk Management	Frank Marshall - Setting Restoration Targets in Florida Bay Using Paleoecology and Salinity / Hydrology Models	Mark Riedel - Marion Mill Pond Dam Removal and Stream Restoration for Great Lakes Fisheries Restoration
9:40am - 10:00am	Fred Bloetscher - Fighting Water with Water: Counteracting the Impact of Sea Level Rise on South Florida Waters	Greg Noe - The Effects of Riparian Ecosystem Processes on Water Quality: Nutrient Mineralization and Budgeting	Jeff Couch - Central and Southern Florida: West Palm Beach Canal (C51) STA 1- East Improvements	Dennis Duke - Challenges in Benefit Analysis and Project Justification	Gail Krantzberg - Great Lakes, Great Stakes	William Brostoff - Estuarine Restoration in San Francisco Bay: Design and Adaptive Management	Kat Morgan - Fish and Floods – Where Trackhoes Hit the Mud in Puget Sound’s Stillaguamish Estuary	Jock Conyngham - Rethinking Instream Structures
10:00am - 10:20am	Steve Traxler - Addressing the Challenge of Climate Change in the Greater Everglades Landscape	Kennedy Paynter - Oyster Restoration in Maryland	Jeremy Crossland - USACE Moves Toward Improved Invasive Species Management Activities	Jeffry Tripe - Integrating Conservation Planning Methods, Conceptual Models, USACE Planning Requirements and NEPA	Kevin Guerin - Canadian Partnerships and Programs for Great Lakes Restoration	Brian Mulvey - Forecasting Fish Response to Habitat Features in Developing Riparian Project Design Alternatives	Chris Cotroneo - Working Towards Nutrient Reduction in Eutrophic Urban Estuary: Ribbed Mussel Biofiltration in Jamaica Bay	Elvidio Diniz - Dam Removal Impacts – Planning Considerations
10:20am-10:30am	AM Break and Session II Poster Removal (Exhibit Hall - 3rd Floor)							

FRIDAY	Friday, August 5, 2011 (continued)
10:30am-12:00pm	<p><b>Closing Plenary Session - Restoration After the Deepwater Horizon Oil Spill</b> (Harborside Ballroom A &amp; B - 4th Floor)</p> <p><b>MODERATOR: Suzette Kimball</b>, Deputy Director, US Geological Survey</p> <p><b><u>Plenary Speakers:</u></b></p> <p><b>Lisa Jackson</b>, Administrator, US Environmental Protection Agency (EPA) <b>Garret Graves</b>, Chair, Coastal Protection and Restoration Authority of Louisiana (CPRA) <b>Don Boesch</b>, President, University of Maryland Center for Environmental Science (UMCES)</p>
12:00noon	CONFERENCE CONCLUDES
10:30am-2:00pm	<p><b>Exhibitors &amp; Session II Posters Move Out</b> (All displays must be removed by 2:00pm)</p>

**From:** Carmela McHenry  
**Sent:** Thursday, July 14, 2011 5:28 PM  
**To:** Karen Clark  
**Subject:** Dinner in DC on August 1st **\*\*UPDATE\*\***

Hi Karen:

Per our conversation today (7/14) via phone --- I've just touched base with Ed and he said to please have WWD make the dinner reservations, in DC, on August 1st. I assume 6:00/6:30 PM (EDT) is a good time...just in case the Sac travelers need to get settled in.

To better assist you, as of today, the **head count for dinner is 8 people**...may have to move up to 9 if Rubio is able to attend (I'll keep you posted as the date gets closer).

At your request – Once Joe Findaro and/or his assistant confirms the reservations, below is the list and the e-mail addresses of the attendees:

TO: Tom Birmingham  
Ed Manning (emanning@ka-pow.com)  
Joe Findaro  
Dave Puglia (dpuglia@wga.com)  
Cathleen Enright (CEnright@wga.com)  
Ken Barbic (KBarbic@wga.com)  
Tom Nassif (tnassif@wga.com)  
David Bernhardt (dbernhardt@bhfs.com)

CC: Karen Clark  
Carmela McHenry (cmchenry@ka-pow.com)  
Candy Newland (CNewland@WGA.com)  
Cheryl Hall (chall@WGA.com)

Thanks again for your help regarding this matter. If you have any questions and/or concerns, please don't hesitate to call me at 916-498-7711. Enjoy the rest of your day!

Best,

Carmela

*Carmela McHenry*  
(Direct) 916-498-7711  
(Fax) 916-448-4923

**From:** Carmela McHenry  
**Sent:** Thursday, July 14, 2011 12:25 PM  
**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** **\*\*RE:** Flights to DC, Dinner in DC on Monday Aug 1 and Mtgs in DC on Aug 2**\*\***

Hi Karen:

Hope your Thursday is going well.

Ed asked that I follow-up with you regarding the DC trip on August 1-3. We got the green light and Ed said to coordinate the flights with you.

Also, Ed and Dave Puglia want to have a dinner, on August 1<sup>st</sup>, with Tom, Ed, Joe Findaro, David Bernhardt, Dave, Tom Nassif, Barbic and Cathy Enright of WGA DC office. Possibly Senator Rubio, if he is available. It would be a good chance to get our group down, prior to the meetings on August 2<sup>nd</sup>, and to build personal comfort level among people who haven't spent a lot of time with each other.

I have yet to schedule Ed's flights. Ed wants to know if Tom wants to travel together on the 1<sup>st</sup>. Nassif and Puglia will arrive in Dulles at 3:45 PM...with United Airlines.

Please call me if you want to discuss at 916-498-7711.

Thanks.

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

**From:** Ed Manning

**Sent:** Thursday, July 14, 2011 12:10 PM

**To:** Carmela McHenry

**Subject:** FW: Dinner on Monday Aug 1?

**Ed Manning**  
**KP PUBLIC AFFAIRS**

1201 K Street, Suite 800, Sacramento, CA 95814

p. 916.448.2162 f. 916.448.4923

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**From:** Dave Puglia [<mailto:DPuglia@WGA.com>]

**Sent:** Thursday, July 14, 2011 11:53 AM

**To:** Ed Manning

**Subject:** DC: Dinner on Monday Aug 1?

Ed,

If possible, we should get our group (the Toms, you and me, Findaro, Bernhardt, plus Barbic and Cathy Enright of WGA DC office) together for dinner on Monday evening Aug. 1. Good chance to get our schtick down and build personal comfort level among people who haven't spent a lot of time with each other. Of course include Rubio if he's able.

Nassif and I land about 3:45 at Dulles on the 1<sup>st</sup>. Are you taking the United direct Sac to Dulles that day?

Let me know what you think.

Dave

**From:** Bernhardt, David L.  
**Sent:** Friday, July 15, 2011 7:36 AM  
**To:** Karen Clark  
**Subject:** RE: PR/Legislation Conf. Call Reminder

Karen: Is the call happening today, Tom is not on.

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, July 14, 2011 1:35 PM  
**To:** Tony Coelho; Bill Kahr; Carmela McHenry; Carolyn Jensen; Bernhardt, David L.; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** PR/Legislation Conf. Call Reminder

All,

This is a reminder that we'll have a PR/Legislation conference call tomorrow (Friday) at 7:30 a.m. PST. Let me know if you have any questions.

Thanks!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark

**Sent:** Friday, July 15, 2011 8:31 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conf. Call

All,

I'm not sure where Tom was this morning regarding our conference call. I think he may have gotten delayed by another meeting. If I hear back from him that he'd like to reschedule the PR/Legislation conference call, I'll let you know.

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

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*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*



**From:** Jackson, Kokita V.  
**Sent:** Wednesday, July 27, 2011 9:18 AM  
**To:** kclark@westlandswater.org  
**Subject:** Contact Info for Craig Manson

Hi Karen,

I'm trying to get Craig Manson's contact information for David Bernhardt. Can you please provide me with Mr. Manson's office and direct phone and his e-mail address and confirm the additional info I have below?

a) Name	Craig Manson
b) Title	General Counsel
c) Company	Westlands Water District
d) Address	P.O. Box 6056 Fresno, CA 93703
e) Email	
f) Phone Number	559.224.1523

Thanks!

Kita

**KoKita V. Jackson**  
Legal Administrative Assistant  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW Suite 510  
Washington, DC 20005-7353  
tel 202.652.2349  
fax 202.296.7009

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**From:** Burman,Brenda W

**Sent:** Wednesday, July 27, 2011 12:15 PM

**To:** Burman,Brenda W; Cindy Kao; Craig Manson; Frances Brewster; gzlotnick@h2oesq.com; 'Joan Maher'; Jon Rubin (jrubin@bhfs.com); Judy Bendix ([REDACTED]@[REDACTED] [REDACTED] Kear,Adam C; 'Lynn Hurley'; Roberts,Jaime; Rodriguez, Larry; Sheehan,Rebecca D; Simonek,Laura J; Smith,Lynda A

**CC:** Anderson,Barb; Ara Azhderian (ara.azhderian@sldmwa.org); Arakawa,Stephen N; Byron Buck; Culjis,Lisa M; Jason Peltier; Patterson,Roger K; Philp,Thomas S; Terry Erlewine; Winn,Rochelle R

**Subject:** mwd past comments on draft delta plans

**Attachments:** 031011 MWD comments re DSC 1st Draft Delta Plan.pdf; MWDSC\_050611.pdf; MWD\_061011.pdf; MWD Comments 071311.pdf

**Brenda Burman**

**Special Projects Manager, Bay-Delta Initiatives  
Metropolitan Water District of Southern California  
1121 L Street, suite 900  
Sacramento, CA 95814  
Office: (916) 650-2630**

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THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

*Office of the General Manager*

March 10, 2011

Mr. Phillip Isenberg, Chairman  
Delta Stewardship Council  
980 Ninth Street, Suite 1500  
Sacramento, CA 95814

Dear Mr. Isenberg:

Comments Regarding First Staff Draft Delta Plan

The release of the First Staff Draft of the Delta Plan is a welcome and encouraging milestone for the Delta Stewardship Council in its planning process to complete a final plan by the end of this year. The Metropolitan Water District of Southern California supports the process developed by the Delta Stewardship Council to release a series of subsequent drafts to provide ample public participation and comment throughout the process.

Metropolitan recognizes the preliminary nature of this first draft and how key details will be emerging in subsequent drafts. The overall structure of the draft Plan appears to be a workable platform for the creation of a successful, final document. At this early stage, Metropolitan would like to convey comments on this first draft in three important areas:

1. **Scope of Delta Plan.** Metropolitan strongly supported the 2009 package of legislation that led to the creation of the Delta Stewardship Council and its crafting of a Delta Plan to serve as a much-needed tool to guide and coordinate the actions of local, state and federal agencies. It is important to keep the focus of the Delta Plan process in the direction provided by the legislation and address the issues of the legal Delta. Broadening of the Delta Plan effort beyond that scope would be duplicative of other water management planning efforts by a variety of other governmental entities and could jeopardize the development of a successful and timely final plan.
2. **Chapter 5 – Manage Water Resources.** The end of Chapter 5 includes a series of categories “to be considered as a basis for development of policies and recommendations for performance measures and targets to manage water resources.” The Delta legislation of 2009 directs the Delta Stewardship Council to promote a more reliable water supply, promote statewide conservation and promote options for new and improved infrastructure relating to

water conveyance in the Delta. This role of promoting sound water management is distinct from the role of other existing governmental agencies, including Metropolitan, to realize these goals. A variety of state mandates and local/regional efforts already exist pertaining to water use efficiency, recycled water and groundwater management, as a few examples. In many of these categories, the state, working with interested stakeholders, has already developed policies and recommendations, and in some cases performance measures. Any successful promotion by the Delta Stewardship Council of sound water management practices must recognize and be in concert with these existing efforts.

Last year, Metropolitan completed a two-year process of updating Southern California's long-term water strategy, our Integrated Resources Plan, which touches on many of the categories identified in the draft Delta Plan. As we have offered in the past, Metropolitan would welcome an opportunity to review our Integrated Resources Plan with the Delta Stewardship Council to advance the public understanding of Metropolitan's long-term water plan for Southern California and to advance the Council's ability to promote sound water practices statewide.

In addition, staff comments at the February 25 Delta Stewardship Council meeting suggested that the Delta Plan may consider future renewals of contracts for the State Water Project and Central Valley Project as "covered actions" that are subject to the Council's non-binding consistency review process. The Legislature provided no direction to the Council for such an action. The Delta Stewardship Council should avoid establishment of a double standard in its Delta Plan that treats one set of water users differently than another. There are many other exporters of water from the Delta watershed along with many users of water within the watershed. To the extent there are issues related to their usage these are handled by the State Water Resources Control Board. That is the appropriate forum to address these issues and individual entities rights and contracts should not be addressed on an ad hoc basis by a duplicative Delta Stewardship Council process.

3. **Chapter 8 – Reduce Risks to People, Property, and State Interests in the Delta.** The Delta Plan should include a comprehensive strategy of promoting strategic levee investments in order for California to meet the co-equal goals of ecosystem restoration and water supply reliability in the Delta. An effective strategic levee investment plan must do the following: (1) identify the potential improvements with the greatest benefits so that funds can be expended accordingly; (2) explicitly state that levee improvements be commensurate with benefits; (3) reference the previous reports by the Public Policy Institute of California and UC Davis that have concluded that not all Delta islands are economically sustainable; and (4) promote the successful evolution of some islands to habitat.

Mr. Phillip Isenberg, Chairman

Page 3

March 10, 2011

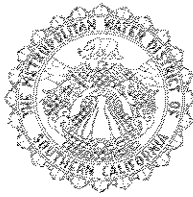
The Delta Plan should also reference the ongoing initiatives addressing Delta emergency preparedness as vital for the protection of life and property, and for the protection of Delta water supplies. The DWR Delta Flood Emergency Preparedness, Response and Recovery Program, being undertaken in coordination with the U.S. Army Corps of Engineers Delta Emergency Operations Plan, local emergency operations plans and water stakeholders, and within the boarder auspices of the Office of Emergency Services, is due for draft release in 2011. This Program covers a range of emergency response strategies from isolated single-island failures, up to and including major catastrophic multiple-island failures causing disruption to the vast majority of the Delta and to water exports. This Program is expected to improve response and minimize recovery time in the Delta focusing on (1) life, property, critical infrastructure and environment, (2) water quality impacts of interests reliant on the Delta, and (3) coordinated sequential or simultaneous response to isolated or multiple levee breaks.

Metropolitan worked closely with the State and Federal Contractors Water Agency in the preparation of their detailed comments on the draft Delta Plan submitted to you on March 3, and we support those comments. We appreciate the opportunity to comment on this First Draft Delta Plan and look forward to future refinements of this vital planning effort for the Delta.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Kightlinger". The signature is fluid and cursive, with the first name "Jeff" and last name "Kightlinger" clearly distinguishable.

Jeffrey Kightlinger  
General Manager



THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

*Office of the General Manager*

May 6, 2011

Mr. Phil Isenberg, Chair  
Delta Stewardship Council  
980 Ninth Street, Suite 1500  
Sacramento, CA 95814

Dear Mr. Isenberg:

Comments Regarding Third Staff Draft Delta Plan

The Metropolitan Water District of Southern California (Metropolitan), after reviewing the Third Staff Draft Delta Plan (Draft Plan) of April 22, wishes to express its appreciation for the work the Delta Stewardship Council (Council) has done and highlight several areas of remaining concern we have with the Draft Plan's ability to achieve the co-equal goals of ecosystem restoration for the Delta and water supply reliability for California. Metropolitan has been participating in a comprehensive comment process with other water agencies and other key stakeholders and endorses the letters dated May 6, 2011 submitted by a coalition of statewide water and Delta interests and the State and Federal Contractors Water Agency. However, Metropolitan wishes to convey herein specific comments that could acutely impact our six-county service area and Delta action plans established by Metropolitan's Board of Directors.

1. Regional Water Self-Reliance. Metropolitan is concerned with the Council's proposal to deem future water operations in the Delta inconsistent with the Delta Plan if a "recipient region" fails to comply with "water sustainability" policies of the Council. The Draft Plan offers no definition of failure. It seeks to review local water rate structures and their role in promoting conservation; review a region's decisions with respect to meeting the 20 Percent By 2020 Legislation; and decide whether the region has complied with a new Council requirement to add elements to urban and agricultural water management plans. If the Council decides the region has not satisfied these new requirements, it proposes to impose the draconian penalty of summarily vetoing water operations actions as inconsistent. In Metropolitan's service area alone, there are more than 300 such local rate structures. There are approximately 120 urban water management plans as well. It is unworkable for the Delta Stewardship Council to collect and review all these documents as part of a process to examine future actions in the Delta itself. The regulatory approach put forth in the Draft Plan to promoting regional self-reliance simply will not work under

Mr. Phil Isenberg

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May 6, 2011

the weight of the paperwork bureaucracy that it would create. Moreover, the Council's proposal to veto otherwise legitimate covered actions because it is not happy with decisions made at the local level on actions taken outside of the Delta is not authorized by the Delta Reform Act. The Council's consistency authority applies only to actions "occurring in whole or in part within the boundaries of the Delta or Suisun Marsh," and only if the action within that geographic area has a "significant adverse impact on achievement of one or both of the coequal goals." On this area, a reasonable and achievable first step would be to recommend that urban and agricultural management plans articulate how they plan to address the statewide policy of improving regional self-sufficiency. Such legislation to require this articulation is now pending before the Legislature, where it should be.

2. Water Transfers. Metropolitan is concerned that the economic impact in California of future drought cycles could be worsened by the Council intervening in the future water market. Water transfers already are often subject to the CEQA public environmental review process; the public approval process of the governing bodies of both selling and buying water agencies; and most undergo a thorough review process by one or more other state and federal agencies, including the California Department of Water Resources, the State Water Resources Control Board (SWRCB), and the fishery management agencies. The Draft Plan calls for an additional review of these transfers by the Council, and their rejection as being inconsistent with the Delta Plan if recipient regions "fail" in terms of water sustainability. Sellers, particularly farmers who need to make crop decisions, have a limited window to decide whether to engage in any transaction. An additional layer to the transaction process is a threat to these crucial transactions and a threat to improving water supply reliability for California. Metropolitan recommends that you remove this requirement in order to promote a more robust future water market rather than to discourage it with a new regulation.
3. Delta Flow Criteria. The Draft Plan includes a proposed policy regulation to alter the Bay-Delta Strategic Workplan of the SWRCB. The SWRCB has wisely decided to review water quality objectives relating to the operation of the State Water Project and Central Valley Project when the Bay Delta Conservation Plan (BDCP) is completed. BDCP will include a comprehensive package of new water operation criteria, flow regimes, habitat restoration and a strategy to address other stressors. Once the comprehensive nature of BDCP is known, SWRCB will be able to address the needs for water quality objectives and flow requirements in their proper context. The Public Policy Institute of California in December 2009 eloquently described the "California Water Myth" that "More Water Will Lead to Healthy Fish Populations." The package of habitat and water conveyance/operations improvements within BDCP will provide the SWRCB with the necessary context to make accurate, informed decisions on flow requirements and water quality objectives. Calls for SWRCB to make these decisions outside of this context poses a threat to achieving the co-equal goals and violates the Delta Reform Act's specific preservation of SWRCB's authority over water rights and water quality. Metropolitan

Mr. Phil Isenberg

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May 6, 2011

encourages that you support and urge the SWRCB to expeditiously complete its existing Bay-Delta Strategic Workplan and incorporate its timetable and strategy as part of the Delta Plan.

4. Bay Delta Conservation Plan. The Delta Reform Act provided BDCP with a clear path to implementation by directing its insertion into the Delta Plan if it meets certain clear standards, such as its compliance with the Natural Communities Conservation Plan process. The Draft Plan asserts that "completion and full implementation of the BDCP is not equivalent to satisfying the Act." The Legislature's direction to include the BDCP into the Delta Plan was clearly intended to have real meaning, not an illusory one. Metropolitan recommends deletion of this passage and in its place to affirm that actions within BDCP, once they are in the Delta Plan, are consistent with the Delta Plan itself.
5. Future Water Contracts. Metropolitan supports transparent public processes, yet objects to the Draft Plan's efforts to specify a particular public process for "future contracts and agreements to export water from the Delta." The current proposal could lead to key water decisions being deemed inconsistent with the Delta Plan because of the Council's dissatisfaction with the process that led to a decision, not the substance of the decision itself. This should be more generally stated to call for compliance with relevant existing public processes without reference to a particular process.

Metropolitan has taken considerable strides in advancing regional self-sufficiency through an Integrated Resources Plan (IRP). It elevates conservation to Southern California's largest future "supply." If successfully implemented in conjunction with the other actions contemplated by the Delta reform legislation, Metropolitan's average-year water sales to its 26 Member Agencies will remain essentially flat for roughly half a century. But the completion of the Delta Plan, BDCP, and the Bay-Delta Strategic Workplan of the SWRCB are all crucial to meeting the IRP and should not be thrown into conflict by an overly expansive and regulatory Delta Plan. While changes are necessary to the Draft Plan, a valuable and effective planning document for the Delta is within reach. We look forward to working with you and your staff to create a workable, historic planning document.

Sincerely,

  
Jeffrey Kightlinger  
General Manager

TSP:rrw





THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

*Office of the General Manager*

June 10, 2011

Delta Stewardship Council  
980 Ninth Street, Suite 1500  
Sacramento, CA 95814

**Sent via e-mail to Individual Council Members  
and Council Executive Director**

Dear Chairman Isenberg and Members of the Council:

Specific Revisions to Third Staff Draft Delta Plan

The Metropolitan Water District of Southern California (Metropolitan) previously submitted comments to the Council on the Third Staff Draft Delta Plan (Draft Plan) that addressed several areas of remaining concern we have with the Plan's ability to achieve the co-equal goals of ecosystem restoration for the Delta and water supply reliability for California. Upon further review of the Third Draft Plan, Metropolitan developed suggested revisions that address many of our key concerns. We ask that you please consider the attached revisions to chapters 3, 4, 5 and 7 as you continue your work to complete the Delta Plan.

Metropolitan is also participating in the coalition of statewide urban and agricultural interests that is developing an alternative Delta Plan, and we support the coalition letter submitted to you on June 10. The specific Delta Plan revisions we are proposing are intended to be consistent with the coalition approach for an alternative Delta Plan.

Overall, Metropolitan's proposed revisions to the Third Draft Plan seek to create a plan that draws on the expertise and outcomes of the agencies that have responsibilities in the Delta. The proposed revisions modify the description of the Council's role and authorities in water management, ecosystem restoration and Delta risk reduction to be consistent with existing law, and rephrase some of the policies more appropriately as recommendations to state agencies or the Legislature. Following is a summary highlighting Metropolitan's proposed revisions to the Draft Plan chapters.

- Revisions to Chapter 3 clarify the definition of covered action and the description of the process to certify consistency of covered actions with the Delta Plan.
- Revisions to Chapter 4 clarify the policies and recommendations addressing regional self reliance to emphasize recommendations to the appropriate agencies to develop policies and guidance for a new water sustainability element in the Urban Water Management Plan (or an equivalent plan). Other revisions properly place the discussion of Delta flow

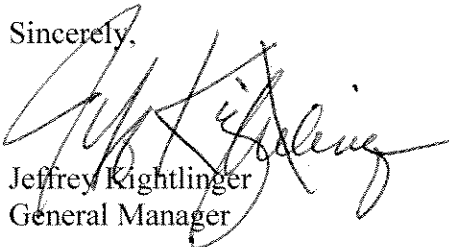
June 10, 2011

criteria as a recommendation to the State Water Resources Control Board and urge the State Water Board to consider the many other factors that impact the Delta.

- Revisions to Chapter 5 clarify the role of the Bay Delta Conservation Plan in achieving the co-equal goals.
- Revisions to Chapter 7 incorporate the essential actions necessary for the Council to meet the overarching and long-term economic or ecosystem sustainability goals required to meet the Council's responsibilities under the Delta Reform Act.

We urge you to consider these revisions to the Delta Plan. We believe these revisions are an essential step to creating a workable Delta Plan that provides an effective role for the Delta Stewardship Council to organize and encourage state and federal agency actions and decisions that are necessary to achieve the co-equal goals.

Sincerely,



Jeffrey Kightlinger  
General Manager

Attachments

cc: Members of the Delta Stewardship Council  
Mr. Joseph Grindstaff

# Chapter 3

## Governance: Implementation of the Delta Plan

### Covered Actions Are a Core Responsibility

Central to the work of the Council is this Delta Plan. In contrast to plan implementation in most governmental contexts, the Council does not exercise direct review and approval authority over proposed actions for consistency with the Delta Plan. In most cases, the Delta Plan functions as a strategic plan in that it is a guidance and recommendation document. However, in some cases, actions taken by local or State agencies are “covered actions” as defined in Water Code section 85057.5. The State or local agency proposing to carry out, approve, or fund a “covered action” certifies the consistency of the covered action with the Delta Plan and files a certificate of consistency with the Council. A certificate of consistency may be appealed to the Council within 30 days, alleging that the proposed covered action is not consistent with the Delta Plan. Upon receiving such an appeal, the Council has 60 days to hear the appeal and an additional 60 days to make its decision and issue specific written findings. These indirect processes and tight time lines are unique among California state agencies. They will work most effectively if based on clear regulations, transparency, and energetic Council management of its agenda.

Only certain activities qualify as covered actions, and the Act establishes both criteria and exclusions. This Delta Plan further clarifies what is and is not a covered action. As an example, routine levee maintenance by a reclamation district in the Delta would not be a covered action because it is statutorily excluded. Also, an addition to a house in an incorporated city would likely not be a covered action because it would not appear to have a significant impact on the Delta. However, a new intake for water supply from the Delta, development of a subdivision in a Delta floodplain that does not meet exclusion criteria in the Act, or establishing a new tidal marsh area are likely to be covered actions.<sup>1</sup> The ultimate determination of whether or not a proposed project is a covered action rests with the proponent, the state or local agency. However, any determination that a proposed project is not a covered action under the Act may be challenged in court. While the Council does not make the decision whether a proposed project is a covered action, the Council is authorized and willing to work with the proponent to provide advice.

This Delta Plan incorporates and builds upon existing state policies where possible, with the intention of meeting the Act’s requirements without establishing an entirely new set of policies. For example, Delta Plan regulatory policies on reducing flood risk incorporate recent California legislation that requires upgrades to levees protecting urban areas.

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<sup>1</sup> There are specific exemptions for land in the Secondary Zone that are consistent with a sustainable communities strategy or where a notice of determination was filed by September 30, 2009. For a more detailed list see Water Code section 85057.5.

In other cases, Delta Plan regulatory policies seek to prevent actions that may preclude the future implementation of projects that meet the requirements of that Act, such as the acquisition of floodplain area for construction of a new bypass or restoration of certain lands uniquely suited to habitat. Similarly, the Delta Plan includes regulatory policies to protect floodplains and floodways until studies are completed by the Department of Water Resources.

The Act requires the Council to establish and oversee a committee of agencies responsible for implementing the Delta Plan. The statute directs each agency to coordinate its actions pursuant to the Delta Plan with the Council and other relevant agencies. The Council will commence regularly scheduled coordination meetings of the appropriate and interested agencies upon adoption of the Delta Plan. Council staff has met with federal agencies and is developing the Delta Plan in consultation with these agencies in order to pursue future consistency and compliance with the Coastal Zone Management Act, as required by Water Code section 85300(d)(1)(A).

## How Will the Regulatory Policies of the Delta Plan Work in Practice?

This section includes a discussion of the general requirements for certifying consistency with the Act and additional examples of covered actions. Delta Plan policies are not intended and shall not be construed as authorizing the Council or any entity acting pursuant to this section, to exercise their power in a manner which will take or damage private property for public use, without the payment of just compensation. This policy is not intended to affect the rights of any owner of property under the Constitution of the State of California or the United States. None of the Delta policies increase the State's flood liability.

## What Is the Definition of a “Covered Action”? Who Determines Whether a Proposed Plan, Program, or Project Is a “Covered Action”?

A “covered action” is defined in the Act as:

*“...a plan, program, or project as defined pursuant to Section 21065 of the Public Resources Code that meets all of the following conditions:*

- 1. Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;*
- 2. Will be carried out, approved, or funded by the state or a local public agency;*
- 3. Is covered by one or more provisions of the Delta Plan;*
- 4. Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta.” (Water Code section 85057.5(a))*

The first step in determining a “covered action” is to identify whether the proposed plan, program, or project meets the definition in Public Resources Code section 21065. That particular provision is the section of the California Environmental Quality Act that defines the term “project” for purposes of potential review under the California Environmental Quality Act (CEQA). ~~It is important to note, however, that CEQA’s contains various statutory and categorical exemptions—which are considered for possible application in a CEQA analysis only after the threshold determination of a CEQA that exempt an action that otherwise would meet the basic definition of a “project.” is made—are not~~

~~similarly incorporated by cross-reference in the definition of “covered action.”~~ Thus, for example, while ~~one section of a proposed action might meet the basic definition,~~ CEQA provides that its terms do not apply to “ministerial projects” (see Public Resources Code sec. 21080(b)(1)); if a proposed action that in the first analysis would be a project under CEQA and thus a covered action under the Act, fits the “ministerial” exemption, those types of projects do it would not fall under the CEQA or the Act’s definition of “covered action.”

The next step in determining a covered action is to review the four additional conditions in the definition of “covered action,” all of which must be met by a proposed plan, program, or project, even if it meets the CEQA definition of a “project.”

In order to qualify as a covered action, the action must occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh. It must be carried out, approved, or funded by the state or a local public agency.

A proposed plan, program, or project must be covered by one or more provisions of the Delta Plan, ~~meaning that a regulatory policy is applicable to the proposed action.~~ The Delta Plan may exclude specified actions; therefore, those actions would not be covered by one or more provisions of the Delta Plan.

In addition, a proposed plan, program, or project must have a “significant impact on achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta” under Water Code section 85057.5(a)(4). For this purpose, the Council has determined that “significant impact” means a substantial or potentially substantial change in existing conditions that is directly, or indirectly, ~~and/or cumulatively~~ caused by a project and that will ~~or may affect~~ significantly impact the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and State interests in the Delta.

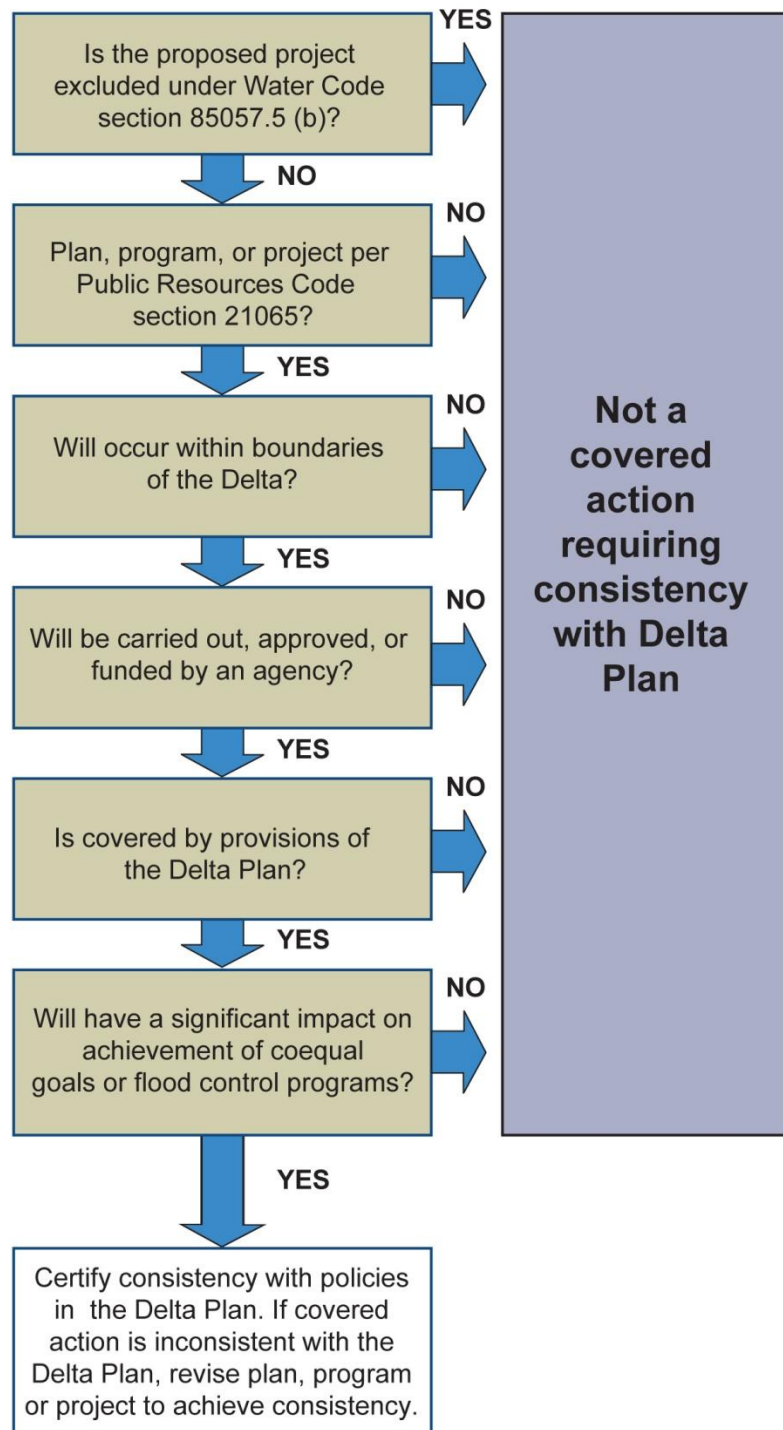
Certain actions are statutorily excluded by the Act from the definition of “covered action,” for example:

- ϕ a regulatory action of a state agency (such as the adoption of a water quality control plan by the State Water Resources Control Board, or the issuance of a California Endangered Species Act permit by the Department of Fish and Game),
- ϕ routine maintenance and operation of the State Water Project or the federal Central Valley Project, and
- ϕ routine maintenance of levees by a reclamation district (Water Code section 85057(b)).

As specified in Paragraph 2 of the Council’s Administrative Procedures Governing Appeals (Appendix A), if requested, the Council’s staff will meet with an agency’s staff during “early consultation” to review the consistency of a proposed action and to make recommendations. The agency’s staff may also seek clarification of whether a proposed project is a “covered action,” provided that the ultimate determination on whether it is a covered action shall be made by the agency, subject to judicial review.

Figure 3.1 shows the steps in identifying a covered action. Agencies retain flexibility in how to meet these responsibilities for covered actions within the parameters of other legal authorities.

**Figure 3.1**  
**Decision Tree for State and Local Agencies on Possible Covered Actions**



WBG01281114346SAC Figure\_3-1.ai

## Certifications of Consistency

State or local agencies that propose to undertake “covered actions” are required to certify with the Council, prior to initiating implementation, that these proposed plans, programs, or projects are consistent with the Delta Plan (Water Code section 85225 et seq.). The Council will develop a check list which agencies may use to facilitate the process. Additionally, as required in statute, an agency that proposes to undertake a covered action must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with the Delta Plan (Water Code section 85225). These findings must be submitted to the Council as part of the certification of consistency. Any person may appeal the certification of consistency and, if a valid appeal is filed, the Council is responsible for subsequent evaluation and determination—as provided in statute and the Council’s Administrative Procedures Governing Appeals—of whether the proposed covered action is consistent with the Delta Plan’s ~~regulatory policies~~. More than one ~~provision regulatory policy~~ in the Delta Plan may apply to a covered action.

If the Council determines on appeal that a covered action is not consistent with the Delta Plan it will remand the proposed action to the state or local public agency. The state or local public agency may decide to proceed with the covered action as proposed, or as modified to respond to the Council’s findings, despite a Council determination that it is not consistent with the Delta Plan. However, prior to proceeding the state or local public agency must file a revised certification that addresses each of the findings made by the Council. (Water Code Section 85225.5) While the state or local public agency may choose to proceed with a covered action even though the Council has determined it is not consistent with the Delta Plan, the determination of the Council will likely be a consideration in obtaining regulatory approvals for the action.

A covered action must not only be consistent with the Delta Plan at time of certification, but to ~~remain be~~ it must also be implemented as described in its finding of consistency.

Certifications for consistency must demonstrate that a covered action is consistent with the Delta Plan by being fully transparent, disclosing potential impacts, demonstrating legal authority and that the action can be implemented as described in its finding of consistency~~sufficient capacity~~, complying with all relevant laws, and identifying how best available science will be used in decision-making and adaptive management.

The Act contains multiple references to the use of best available science, including specific requirements such as, for example, that ongoing ecosystem restoration or water management decisions include a science-based, transparent, and formal adaptive management strategy (Water Code section 85308(f)). Best available science involves not only the use of sound information but is a process that meets the criteria of (1) relevance, (2) inclusiveness, (3) objectivity, (4) transparency and openness, (5) timeliness, and (6) peer review (National Research Council 2004). Best available science is consistent with the scientific process (Sullivan et al. 2006). Best available science is specific to a decision context and would necessarily be related to the specific decision to be made and the time frame available for that decision. For science to be considered “best available” to support a decision, reasonable care must be taken to identify all available and relevant scientific information. Sources for best available science may include peer-reviewed publications, general scientific reports and publications, scientific expert opinion, or even anecdotal evidence. See Chapter 2 for a more detailed discussion of best available science. Table 2-1 establishes the priority for the value placed on each information source.

## Policy

G P1 Certifications for consistency with the Delta Plan must address the following:



All covered actions must be fully transparent by disclosing all potentially significant adverse environmental impacts and mitigations of those adverse impacts.

All covered actions must be based on best available science. [COUNCIL TO DISCUSS FURTHER]

All covered actions must ~~describe the demonstrate~~ managerial and financial capacity to implement the covered action over the long term. ~~Managerial capacity includes ownership and water rights relevant to the covered action. Financial capacity includes budgeting, capital improvement planning, and a financing plan relevant to the covered action.~~

All covered actions must identify and comply with existing relevant law, including water quality regulations and water rights.

Large-scale ecosystem restoration and water management covered actions must describe the process that will include adequate provisions to assure provide continued implementation of adaptive management consistent with the Delta Plan.

~~—This requirement shall be satisfied through:~~

- ~~⊕ an adaptive management strategy consistent with the adaptive management framework of Chapter 2;~~
- ~~⊕ documentation of how the proposed covered action will achieve its desired result;~~
- ~~⊕ performance measures and targets relevant to meeting the Delta Plan's objectives enumerated in Section 85302(c), Section 85302(d), and Section 85302(e);~~
- ~~⊕ monitoring and analyses requirements sufficient to make adaptive management decisions and to capture any effects that may help or hinder achieving the coequal goals as expressed in the Act or the Delta Plan;~~
- ~~⊕ documentation of delineated authority by the agency responsible for the covered action to support the implementation of the full adaptive management process, including planning, implementation, monitoring, data management, analyses, obtaining the best available science, communicating results, supporting decision making, and full implementation of any changes in implementation of the covered action; and~~
- ~~⊕ procedures ensuring public release of all information developed related to adaptive management, including, but not limited to, primary data, modeling, analyses, and syntheses of research findings.~~

## Changing the Delta Plan

### Incorporation of Another Plan into the Delta Plan

The Council may incorporate another plan, in whole or in part, into the Delta Plan. When fully incorporated, these elements of another plan become the basis for consistency determinations and relevant to the actions of State and local agencies. The agency which has the original plan authority will continue to take actions under that authority.



## Incorporation of the Bay Delta Conservation Plan into the Delta Plan

The Bay Delta Conservation Plan is a major project considering large-scale improvements in water conveyance and large-scale ecosystem restorations in the Delta. When completed, it must be incorporated into the Delta Plan if it meets ~~specified~~ conditions [specified in the Act](#). Completion of the Bay Delta Conservation Plan process and the full suite of projects now under consideration in that process would have large impacts on the Delta and would affect the coequal goals. ~~However, completion and full implementation of the Bay Delta Conservation Plan is not equivalent to satisfying the Act.~~

## Transparency and Communications Plan to Implement the Delta Plan

The Council is committed to transparency and effective participation in its processes. To that end, the Council requires full transparency in information provided to it and timely public posting of information relevant to its actions. It will post all communications received.

The Council also seeks strong working relationships with agencies and stakeholders. Important components of those effective working relationships are procedures that ensure transparency and robust procedures for early consultation that are used consistently.

Decisions of the Council will be posted on its website. A public list of policies and plans determined to be consistent and not consistent with the Act shall be maintained on the Council website and included in reports of the Council on its effectiveness in implementing the Act.

Where required by law or as it deems feasible and appropriate, the Council will provide findings for its actions, which shall be posted publicly.

Information developed by the Council or provided to the Council shall be publicly accessible on the Council's website.

## References

- National Research Council, Committee on Defining the Best Scientific Information Available for Fisheries Management. 2004. Improving the use of "Best Scientific Information Available" Standard in Fisheries Management. National Academy Press, Washington D.C. Available from [http://www.nap.edu/catalog.php?record\\_id=11045#toc](http://www.nap.edu/catalog.php?record_id=11045#toc) (accessed July 2010).
- Sullivan, P. J., J. M. Acheson, P. L. Angermeier, T. Faast, J. Flemma, C. M. Jones, E. E. Knudsen, T. J. Minello, D. H. Secor, R. Wunderlich, and B. A. Zanetell. 2006. Defining and implementing best available science for fisheries and environmental science, policy, and management. American Fisheries Society, Bethesda, Maryland, and Estuarine Research Federation, Port Republic, Maryland. Available from [http://www.fisheries.org/afs/docs/policy\\_science.pdf](http://www.fisheries.org/afs/docs/policy_science.pdf) (accessed July 2010).



# Chapter 4

## A More Reliable Water Supply for California

California has outstripped the capacity for its existing infrastructure to satisfy the economic, environmental, and social demands for water (Hanak et. al. 2011). The state uses more groundwater than nature replenishes (Department of Water Resources 2009). Since 1914, the State Water Resources Control Board has issued permits for the diversion [and use](#) of water from the Delta [and its watershed](#), but total actual diversion [and use](#) amounts are currently unknown [in many areas of the state](#) and may be unsustainably over-allocated (State Water Resources Control Board 2008b). [In addition, there is evidence that a significant amount of water diverted and used within the Delta that is not based on, or is in excess of, any demonstrable water right. Enforcement to prevent these illegal diversions has been virtually non-existent, resulting in the reduction in the amount of water available to legal diverters and to instream flow needs.](#) Conflicts over California's water supplies have reached a point where the Legislature has found "the Sacramento-San Joaquin Delta watershed and California's water infrastructure are in crisis and existing Delta policies are not sustainable" (Water Code section 85000).

Variability of water availability is perhaps one of the most dominant characteristics of the state's water supply system. Most of the state's water originates as precipitation that falls during winter months, with about two-thirds of the available runoff coming from the mountains in northern California (Hanak 2011). California has developed a complex and interconnected system of surface reservoirs, aqueducts, and water diversion facilities that store and convey water from areas that have water available for use to urban and agricultural areas that have water needs. These systems were designed during the mid 20th century with minimal consideration of the harm that these water diversions could cause to the environment and native fisheries. As a result, [development and use of the water supply system is one of the many factors that have contributed to the decline in](#) California's native Delta ecosystem ~~is in decline~~.

One of the Delta Reform Act's key objectives is "to provide a more reliable water supply for the state" (Water Code section 29702). Therefore, the Delta Plan focuses on policies and recommendations that will increase the reliability of water supplies in the state that are available to meet demands while, at the same time, reducing local and regional reliance on Delta exports [for their future water supply needs](#) (Water Code section 85021). A responsible plan to improve water supply reliability in the state must address the problem on all fronts: [continue to reduce per capita](#) ~~control~~ water demand and improve conservation; deal with infrastructure limitations on storage and conveyance; [through smarter approaches to water supply operations and regulation, habitat improvement and other actions, restore the ability to divert and use supplies lost to environmental regulation while more effectively protecting and restoring environmental values](#) ~~ensure that water flow standards to protect and restore the Delta ecosystem are updated and enforced~~; and develop additional local and regional water supplies through improved groundwater management, water reuse, groundwater treatment, stormwater capture and recharge, and desalination. Ultimately, ~~water supply~~ reliability [of future water supply needs](#) for the state [largely](#) will be achieved at

the regional level through a combination of sustainable water management, regional self-reliance and water balance, and improved conveyance and storage.

## Policies and Recommendations

### Improve Regional Water Self-Reliance

Since the early 1980s, California has recognized the importance to the state of improving regional water supply self-reliance through conservation and the increased development of local and regional water supplies. These programs and projects increase the reliability of the state's water supplies by lowering ~~controlling~~ overall demand for the state's ~~limited~~ water resources and providing a diverse array of water supplies that often are more resilient under drought, emergency shortage, and climate change conditions.

All regions were originally established with available local supplies. As regions grew, some areas turned to importing water supplies to accommodate anticipated growth. Now as conflict increases on imported supplies, there is a need to enhance local and regional water supply development ~~often makes water available~~ from sources that ~~historically~~ have been unrecognized, underutilized, or unavailable. Decreased reliability of imported supplies, technological advances, and regional collaboration and innovation has made this possible. Recycled water provides an opportunity to use the same water several times before it reaches the ocean.<sup>2</sup> With additional treatment, groundwater that has been rendered non-potable by natural or human introduction of contaminants can be transformed into a drinking water supply. Similarly, desalination allows saline water to be used for drinking water. Stormwater that previously has been channelized to limit flooding and sent to the ocean can be recaptured and used for groundwater recharge (City of Los Angeles, UWMP 2010). Improved local storage, both surface and groundwater, increases the flexible management of water supplies statewide, especially through local conjunctive management programs (Hanak et al. 2011). Even retail and wholesale water rate structures can play a ~~critical~~ role in ensuring that residential and business customers and agricultural users understand the value of the water they use and do their part to conserve the state's water resources. While improvements to statewide water infrastructure remain critically important to long term water supply reliability, California has a wealth of local water resources that can be developed to improve regional self reliance and help achieve the coequal goals in the near term.

ADDITIONAL INFORMATION TO BE PROVIDED ON REGIONAL SELF-SUFFICIENCY USING EXAMPLES FROM APRIL WORKSHOP AND OTHERS WHO HAVE ALREADY EFFECTIVELY INCORPORATED A WATER SUSTAINABILITY /REDUCED DELTA DEPENDENCY ELEMENT IN THEIR URBAN AND AGRICULTURAL WATER MANAGEMENT PLANS/IRWMPs

The State has promoted local and regional water supply planning by requiring local agencies to develop plans, such as Urban Water Management Plans and Agricultural Water Management Plans, that forecast sources of supply and the actions needed (including demand management) to ensure that future demands are met over the next 25 years.<sup>3</sup> Since 2000, the State has also promoted voluntary integrated regional water management planning, recognizing that collaboration among the agencies within a watershed provides opportunities for better water management decisions and coordinated infrastructure

<sup>2</sup> DWR, 2009: Value of water recycling in stretching local water supplies by increasing the number of times that water is used and reused before it reaches the ocean.

<sup>3</sup> Requirement as a condition to receive state funding for water infrastructure from grant and loan programs administered by the state.

investments.<sup>4</sup> Over \$2 billion in State bond funds have been made available to support implementation of projects identified in these plans.

Overall, statewide progress in increasing local and regional water supplies is being made. As of 2011, the Department of Water Resources reported that over 90 percent of the state's population was covered by locally approved integrated regional water management plans. The 2009 California Water Plan indicates that statewide water use efficiency has improved, water recycling is expanding, and other local and regional water supplies are increasing. Most notable are the outstanding water management successes of major population areas, such as the City of Los Angeles, where future new water demands are now projected to be met only through increased conservation and local water supplies (Hanak et al. 2011).

With the enactment of the Delta Reform Act of 2009, it is now the policy of California to reduce reliance on the Delta in meeting future water supply needs [through investment in improved regional water supplies, conservation, and water use efficiency](#) (Water Code section 85021). The Act requires that "each region that depends on water from the Delta watershed shall improve regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects and improved regional coordination of local and regional water supply efforts" (Water Code Section 85021).

However, while voluntary planning and reporting on conservation and water supply projects may occur in a regional context, the decisions to fund and implement these projects remain under the control of individual water agencies. To promote statewide sustainable water use and ensure compliance with the Delta Reform Act, water agencies need to identify their actions and investments to implement conservation and water supply projects and explain how these projects are contributing to regional self-reliance and reduced reliance on the Delta. The state's progress in meeting its regional self-reliance goals should be summarized in future California Water Plan updates.

## ***Problem Statement***

Additional local and regional conservation and water supply development is needed to improve regional self-reliance in order to reduce reliance on the Delta [for future water supply needs](#) and achieve the coequal goals.

## ***PoliciesRecommendations***

~~The following policies (WR P1, WR P2, and WR P3) only apply as regulatory policies as follows:~~

- ~~A. A covered action involving the export of water out of the Delta, or involving the transfer of water through the Delta, is inconsistent with the Delta Plan if the need for that covered action is significantly caused by a recipient region's failure to comply with policies WR P1, WR P2, and/or WR P3.~~
- ~~B. A covered action involving the use of water in part or in whole in the Delta is inconsistent with the Delta Plan if the need for that covered action is significantly caused by the water using region's failure to comply with policies WR P1, WR P2, and/or WR P3.~~

~~In all other situations, WR P1, WR P2, and WR P3 are recommendations.~~

WR RP1 To promote statewide accountability in achieving the coequal goals, [the Council recommends that the Legislature and Governor enact legislation requiring](#) water suppliers that deliver water

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<sup>4</sup> An Integrated Regional Water Management Plan must be approved by the Department of Water Resources to receive bond funding for implementation of identified projects.

diverted or exported from the Delta or the Delta watershed ~~to shall~~, by December 31, 2015, include a new Water Sustainability Element in their Urban Water Management Plan and/or Agricultural Water Management Plan (or an equivalent plan). The Water Sustainability Element shall detail how water suppliers are improving regional self-reliance and reducing dependence on the Delta through investments in local and regional programs and projects. At a minimum, the Water Sustainability Element shall include:

**A Plan for Possible Interruption of Delta Water Supply:** Identify how reliable water service will be provided for a minimum period of at least six months in the event the Delta's export operations are interrupted during an average water year, dry water year, and following three dry water years.

**Evaluation of Planned Investments in Water Conservation and Water Supply**

**Development:** Identify specific programs and projects that will be implemented over the twenty year planning period and how they contribute to the improvement of regional self-reliance and reduced dependence on the Delta, including:

- ☐ Water Conservation and Water Use Efficiency
- ☐ Local Groundwater and Surface Storage
- ☐ Conjunctive Use Programs
- ☐ Water Recycling
- ☐ Use of Currently Non-Potable Groundwater
- ☐ Storm Water Capture and Recharge
- ☐ Saline Water and Brackish Water Desalination

- φ **Evaluation of Regional Water Balance:** Provide an assessment of the long term sustainability of water supplies to meet projected demands within the supplier's hydrologic region, as defined by in the 2009 California Water Plan Update, over the twenty year planning period. If the region lacks balance, indicate the steps that are being taken through the Integrated Regional Water Management Plan to bring the region into balance. If the region is not in balance and its Integrated Regional Water Management Plan is not available or does not identify the steps being taken to bring the region into long-term balance, then describe how the supplier's programs and projects are helping to bring the region into balance.

- φ **Sustainable Water Rate Structure:** ~~Evaluate~~Describe the degree to which the supplier's current rate structure ~~either sustainably encourages and supports~~ or reflects the cost of supplying the resource.

**ADDITIONAL OPTIONS FOR COUNCIL CONSIDERATION:**

Recommend that the Legislature and Governor enact a requirement that ~~Require the addition of~~ a Water Sustainability Element must be included in Integrated Regional Water Management Plans. The element should includes an assessment of the long term sustainability of water supplies to meet projected demands and, if the region is out of balance, a requirement for the implementation of local and regional programs and projects that will achieve regional water balance within the twenty year planning horizon. ~~To be consistent with the Delta Plan, The legislation could require~~ would to be required to be part of a Department of Water Resources-approved Integrated Regional Water Management Plan with a Water Sustainability Element the meets the regional water balance criteria.

~~Convert regulatory policy stated above into a recommendation.~~ Provide recognition/incentive to water suppliers that have achieved regional water balance or have demonstrated long-term

improvement in regional self-reliance and reduced dependence on the Delta. Recommend that state agencies which administer state grants or loans to fund water projects or programs include in their funding criteria a priority for Integrated Regional Water Management Plans (or individual water suppliers) that can demonstrate through their adopted Water Sustainability Element that they have achieved Regional Water Balance (or that, as a water supplier, they have improved regional self-reliance and reduced their dependence on Delta diversions).

WR ~~PR~~2 Water suppliers that deliver water diverted or exported from the Delta or the Delta watershed ~~should shall, at a minimum,~~ meet the standards and timelines established in Water Code section 10608 et seq. and section 10800 for urban and agricultural water use efficiency.<sup>5</sup> Recommend that state agencies that administer state grants or loans to fund water projects or programs include in their funding criteria a priority for water suppliers that meet the standards in Water Code sections 10608 et seq. and 10800.

WR ~~PR~~3 Retail water suppliers that deliver water diverted or exported from the Delta or the Delta watershed ~~shall should,~~ by December 31, 2020, develop and implement a rate structure that ~~sustainably encourages and supports water conservation which may include the adoption of a water budget-based rate structure~~ is consistent with the California Urban Water Conservation Council's Best Management Practice for retail conservation pricing as shown in Exhibit 1 of the "Memorandum of Understanding Regarding Urban Water Conservation in California", to the extent allowed by regulation. Recommend that state agencies that administer state grants or loans to fund water projects or programs include in their funding criteria a priority for water suppliers that have implemented rate structures that sustainably encourage and support water conservation.

## **Recommendations**

WR R~~4~~ If the legislation recommended in WR R1 is enacted, The California Department of Water Resources, in consultation with the Council, the State Water Resources Control Board and others, should develop and approve, beginning one year after enactment by December 31, 2014, Urban Water Management Plan and Agricultural Water Management Plan guidelines for a Water Sustainability Element, based on the criteria contained in WR ~~PR~~1.

WR R~~5~~ If the legislation recommended in WR R1 is enacted, Beginning one year after enactment in 2016, State agencies should prioritize state funding for water agencies in the state that have a complete Water Sustainability Element in their adopted Urban Water Management Plans and/or Agricultural Water Management Plans and or Integrated Regional Water Management Plans.

WR R~~6~~3 A proponent for a new proposed point of delivery ~~from the State Water Project~~ that results in increased demand for diversions from or use in the Delta or the Delta Watershed should demonstrate that the project proponents have evaluated and implemented all other feasible water supply alternatives.

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<sup>5</sup> SB X7-7, also known as the 20% by 2020 legislation, was enacted in 2009. For urban water suppliers, the law requires the state to achieve a 20% reduction in urban per capita water use by December 31, 2020, with incremental progress measured by a 10% reduction by December 31, 2015. Agricultural water suppliers are required to measure the volume of water delivered to customers, adopt a pricing structure based at least on quantity delivered and implement additional conservation measures that are locally cost effective and technically feasible by July 31, 2012. A report on efficient water management practices is required to be included in the supplier's agricultural management plan. In addition, the act requires agricultural management plans to be completed by December 31, 2012, with an update by December 15, 2015, and every five years thereafter. Urban and agricultural water suppliers are ineligible for state water grants or loans unless they are in compliance with the act.



## **Program to Improve Conditions in the Delta and Address Other Stressors to Provide a More Reliable Water Supply**

Over the last two decades the State Water Project and Central Valley Project have lost significant water supply reliability due to environmental regulation. At least to some extent, these losses have been incurred due to the use of flow as a surrogate to mitigate negative impacts not caused by project operations, but by habitat degradation and other stressors. Smarter approaches to water project regulation and flow requirements based on better science that actually focus on cause/effect relationships should be developed and implemented. Just as importantly, habitat improvements and implementation of programs to address the numerous other stressors impacting the Delta will mitigate for their direct impacts on the Delta ecosystem. Chapter 5 describes the habitat degradation and negative impacts of other stressors and provides a number of policies and recommendations to cure that degradation and those impacts. Implementation of those measures will directly address these underlying factors causing or contributing to degradation of the Delta and its resources and will reduce that portion of the regulatory burden that has been imposed on the export projects to mitigate for these other factors. Implementation of the restoration actions included in Chapter 5 will enable the projects to restore a measure of the supply reliability that has been lost and contribute to meeting the goal of providing a more reliable water supply.

## **Delta Instream Flow Criteria and the Setting of Flows**

Long-standing California law has granted to the State Water Resources Control Board considerable authority in the areas of water rights, water quality protection, and the setting of instream water flow criteria. In addition, the State Water Resources Control Board has the authority to enforce the Public Trust Doctrine and the provisions of the California Constitution, in Article X, Section 2, which pertain to the reasonable and beneficial use of water resources of the state to the fullest extent of which they are capable in the public interest.

Unfortunately, as California's water supply has tightened—as the demands for water have increased and the sources of supply become more volatile—the State Water Resources Control Board has been at the center of political disputes over how its decisions on water allocations should be made. Often, the decisions needed to protect the State's interests in ecosystem protection and water supply reliability have been blocked by battles among competing interests, by inadequacies in the science supporting proposed actions or by recent degraded conditions in the Delta and inadequate infrastructure. In addition, many major factors, most of which are not within the State Water Resources Control Board's authority, have degraded the environment of the Delta and its watershed and caused significant reductions in water supply for human uses. The resulting situation downward spiral in which the state now finds itself, with native fish populations crashing and reduced reliability of water exports from the Delta, is unsustainable.

If the coequal goals are to be achieved, it is essential that the State Water Resources Control Board expeditiously carry out its responsibility to complete the work to set flow-reasonable water quality objectives and flow criteria for the Delta and the major tributary streams in the Delta watershed. In doing so, the State Water Resources Control Board must identify the other factors impacting the Delta and its watershed, including recommendations for appropriate action by entities with authority over those other factors (Water Code section 13242). The state cannot afford further delay. It is impossible for the state to plan and build a reliable water system where future ecosystem flow requirements are not known. This is true everywhere in the State but especially true in the Delta. Water suppliers cannot commit to funding new projects and making effective decisions about billions of dollars of infrastructure investments until the State Water Resources Control Board process is complete. Until the flow issue is resolved, every action that potentially increases the amount of water diverted from or moved through the Delta is vulnerable to legal challenge over the question of whether there are sufficient flows to protect and restore the environment.



The State Water Resources Control Board is in the midst of a phased process to review and amend—or to adopt new—[flow water quality objectives and flow requirements](#) for the Delta and its high priority tributary streams. The State Water Resources Control Board has set a work plan and schedule for developing flow standards for the Delta and its watershed. The first step was taken in 2010, when the State Water Resources Control Board completed its report on the *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* (State Water Resources Control Board 2010a). This study provides an assessment of the flows needed to protect the Delta and its ecological resources and does not include other public trust considerations, [or consider the reasonableness of the criteria when balanced against the public interest in the consumptive needs for water, probable future supply needs, economic considerations and control of other factors.](#) (See Water Code sections 13000 and 13241). [The Legislature, in directing the State Water Resources Control Board to take this narrow focus, explicitly recognized the limitations of the flow criteria report by limiting its use to planning \(rather than regulatory\) purposes and providing that the criteria were not to be predecisional. \(Water Code section 85086\(c\)\(1\) While only the starting point for the broader flow standard setting process.](#) However, the report underscores the importance to California of resolving, [as soon as possible, what the appropriate those future flow regimes need to be in the larger context of control of the other factors impacting the Delta and its watershed and the other actions that will be taken as part of the Delta Plan.](#)

Currently, the State Water Resources Control Board is in the process of addressing San Joaquin River flows and expects to complete the first phase of this process by June 2012. The State Water Resources Control Board is coordinating with the Department of Water Resources in its preparation of the Bay Delta Conservation Plan and may consider environmental documentation developed for the Plan in its proceedings. In December 2010, the State Water Resources Control Board completed a prioritized schedule and estimate of costs to complete the instream flow studies for the Delta, in accordance with Water Code Section 85087 (State Water Resources Control Board 2010b).

## **Problem Statement**

The State Water Resources Control Board needs to [review and update Delta water flow requirements as appropriate standards.](#)

## **Policies Recommendations**

WR ~~R7~~P4 The State Water Resources Control Board should [continue to expeditiously complete review of water quality objectives and Delta flow requirements and take steps to implement any revised objectives and flow requirements through water rights proceedings consistent with its “Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary” adopted July 2008. This review should include the flow studies required for high priority rivers and streams in the Delta Watershed, San Joaquin River and its tributaries by Water Code section 85087 by no later than the dates proscribed in that section and the SWRCB’s current consideration of amendments to the San Joaquin River flow objectives. develop flow criteria and establish flows as follows:](#)

WR R8 The State Water Resources Control Board’s program of implementation for water quality objectives and flow requirements should address the control of other factors impacting the Delta and its watershed as necessary to achieve the objectives, including recommendations for appropriate action to other agencies (Water Code section 13241).

- ~~ϕ By June 2, 2014, adopt and implement flow objectives for the Delta that are necessary to achieve the coequal goals.~~
- ~~ϕ By June 2, 2018, develop flow criteria and establish flows for high priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.~~

- ~~φ Prior to the dates indicated in (a) and (b), existing Delta flow objectives shall be used to determine consistency with the Delta Plan. If the State Water Resources Control Board fails to act by the dates indicated, the Council will XXX.~~

**~~OPTIONS FOR COUNCIL CONSIDERATION FOR CONSEQUENCES IF FLOWS NOT ADOPTED:~~**

- ~~— The Council could use the flow criteria identified by the State Water Resources Control Board from its report on the *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* (2010) to determine consistency of covered actions with the Delta Plan.~~
- ~~— Determine that a covered action that would increase the capacity of any water system to store, divert, move, or export water from the Delta and/or the Delta Watershed would not be consistent with the Delta Plan until the revised flow objectives are implemented.~~
- ~~Recommend that the Board cease issuing water rights permits in the Delta and the Delta watershed (or, if the absence of flow criteria is specific to one or more of the major tributaries, then the constraint could be focused to the impacted areas).~~

## Statewide Storage and Conveyance

California's water storage and conveyance system was designed to capture, transport, and deliver water to urban and agricultural end users. This infrastructure was not originally designed to protect ecosystem values and, in its current configuration, is not sufficiently flexible to meet the coequal goals of ecosystem protection and improvements to the state's water supply reliability (Hanak et al. 2011).

Conveyance capacity does not match water storage. During the key times when storage space is available, or there is current demand for water, water often cannot be pumped because the current Delta conveyance system impacts one or more listed species. This issue is being addressed through the Bay Delta Conservation Plan, but improvements in storage and conveyance will be needed while the Bay Delta Conservation Plan is being developed.

Today, the amount of storage capacity is inadequate, especially south of the Delta, to permit water users to take water at times when there is water in the Delta that can be diverted (Hanak et al. 2011). For example, in the spring of 2011, the south Delta pumps were turned off since urban and agricultural water users' needs were met by other water supplies, and storage locations south of the Delta could not take the available water. Looking ahead, these infrastructure challenges will be compounded by the predicted impacts of climate warming on the state's water supplies, as precipitation and runoff patterns shift and sea level rise increases the vulnerability of the Delta to floods. The State Water Project, which owns and operates the lowest elevation dams in the state's water system and controls the Delta intakes for the state system, is particularly vulnerable to these changes (Knowles and Cayan 2002).

In the past decade, the Department of Water Resources has expended tens of millions of dollars on integrated storage investigations to evaluate how surface storage and conveyance may be improved. These studies have confirmed the need for expanded infrastructure; however, as yet, there is no consensus on which storage or conveyance projects the state should select. Even when a decision is made, many of the proposals being studied, especially for the large dam sites, have substantial environmental, political, and financial challenges that may delay or even preclude their construction.

The state must be prepared for the possibility that it could take many more years for the state to select, build, and operate large-scale storage and conveyance improvement projects. As an interim step toward increasing the state's water supply reliability, the state should consider smaller, more incremental operational and storage improvements at existing facilities that can be accomplished within the next 5 to

10 years. In addition, the state needs to consider how groundwater storage and especially conjunctive management programs (in combination with conservation, local water supplies such as stormwater capture and recycled water, and water transfer programs) may significantly enhance the operational flexibility of the state's system and improve the state's water supply reliability.

### **Problem Statement**

Improvements in conveyance and storage are needed to provide more operational flexibility.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

WR R<sup>94</sup> The California Water Commission should hold hearings to identify and evaluate how large-scale storage and incremental improvements to surface and groundwater storage infrastructure and operations may be made in the Delta watershed and in areas that use water from the Delta over the next five to ten years to help achieve the coequal goals.

## **Reporting, ~~and~~ Transparency and Enforcement**

Despite the importance of improving water supply reliability to the state and its economy, California does not have complete ~~has limited~~ information on which to base sound water management decisions. ~~Due to the lack of standardized monitoring and reporting requirements, the state does not know how much water is available or used annually.~~ Since 1914, the State Water Resources Control Board has issued permits for the diversion and use of water from the Delta and in its watershed, but due to the lack of standardized monitoring and reporting requirements, how much water is available and total actual diversion amounts are currently unknown in many areas of the state and may be unsustainably over-allocated (State Water Resources Control Board 2008b). In addition, there is evidence that a significant amount of water diverted and used within the Delta that is not based on, or is in excess of, any demonstrable water right. Enforcement to prevent these illegal diversions has been virtually non-existent, resulting in the reduction in the amount of water available to legal diverters and to instream flow needs. In other regions of the state, water is pumped more quickly out of the ground than it is replenished (Department of Water Resources 2009).<sup>6</sup> Chronic groundwater overdraft statewide—essentially groundwater mining—has been estimated by the Department of Water Resources to be as high as 2 million acre-feet on a yearly average; however, recent satellite measurements of groundwater elevations within the Central Valley alone suggest that the overdraft in the last 7 years has resulted in the loss of 16.5 million acre-feet of groundwater storage (Famiglietti et al. 2011).

In recent years, the state has made a significant effort to quantify and report water use estimates by sector as well as by major hydrologic regions of the state through the California Water Plan (Department of Water Resources 2009). However, much of the water data that is available to the state from local, regional, state, and federal agencies and organizations is collected by these entities using differing methodologies and levels of detail (Hanak et al. 2011). Some data is reported on only a voluntary basis, such as the submission of annual data on regional groundwater elevations to the Department of Water Resources or the submittal of water conservation data to the California Urban Water Conservation Council, which, in 2008, was done by only 225 of the largest urban water suppliers (about half of agencies that could report). But even mandatory sources of local and regional water supply and use data, such as the Urban Water Management Plans that urban retail and wholesale water agencies (serving more than 3,000 customers) are required to update and submit to the Department of Water Resources every

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<sup>6</sup> Chapter 8 Conjunctive management and Groundwater Storage, Vol 2, Resource Management Strategies

5 years, do not use standardized data collection formats nor are they compiled electronically in a central data base. The information from these plans is important, but it is difficult to aggregate on a similar basis ~~inaccessible and as a result virtually useless~~ for the purpose of evaluating statewide water conservation and local water supply development trends that will contribute to the improvement of the state's overall water supply reliability.

~~Another important potential source of information about the state's water supplies are the contracts and transfer agreements involving water from the State Water Project. These documents are not developed through an open and transparent public process, and the resulting contracts and agreements, when released to the public, are difficult to understand, much less to evaluate for their implications for the state's water resources. By comparison, the Bureau of Reclamation has adopted and uses procedures that ensure that contracts and transfer agreements involving water from the Central Valley Project are developed in full view of the public, from the proposal stage through negotiations to the final decision-making. In addition, the Bureau of Reclamation requires the submission of a standardized annual report from entities that receive water from the Central Valley that includes a full water balance, including production from all sources, system losses, and changes in storage and water use as a condition in its contracts and transfer agreements (U.S. Bureau of Reclamation 2011).~~

### **Problem Statement**

Improved information needed on water use and management in California.

### **Policies Recommendations**

WR ~~R10~~P5     The Legislature should consider amendments to the Water Code to standardize the collection and compilation of data regarding diversion and use of water from the Delta and its watershed. To be consistent with the Delta Plan, future contracts and agreements to export water from the Delta and/or to move water through the Delta shall be developed in a transparent manner consistent with the public process employed by the U.S. Bureau of Reclamation for Central Valley Project water supply contracts and transfers.

WR R11 The Legislature should consider amendments to the Water Code to expand the State's ability to enforce water rights by explicitly authorizing SWRCB to hire administrative law judges or similar hearing officers with authority to review and enforce proscriptions against illegal diversions. Funding should be designated to provide adequate resources to support these investigations and adjudications.

### **Recommendations**

WR ~~R12~~R5     The Department of Water Resources, in coordination with the State Water Resources Control Board, Regional Boards, the Department of Public Health and the Council, should complete the proposed Water Planning Information Exchange (Water PIE) by January 1, 2014. This new electronic system should consolidate information in an electronic format and make it available online. It should be designed to simplify reporting processes, reduce the number of required reports, and be coordinated with the reporting requirements for the Urban Water Management Plans/Agricultural Water Management Plans and Integrated Regional Water Management Plans. Water users that receive water diverted or exported from the Delta or the Delta watershed should be full participants in the Water PIE when it becomes available. The information collected through the Water PIE should be published incorporated in the analysis for the California State Water Plan Update every five years.

## Groundwater

Groundwater is a major source of California's water supplies. It provides roughly 30 percent to 40 percent of the state's gross urban and agricultural water use (Hanak et al. 2011). Despite the critical nature of this water supply to the state, especially during dry years, California does not have a statewide management program or statutory permitting system for groundwater. Improved groundwater management, especially in basins that are chronically over-pumped, is needed to achieve the coequal goals.

The state has a long history of managing groundwater through locally controlled activities. In several areas of the state, local and regional agencies have developed voluntary sustainable groundwater plans and some have adopted groundwater ordinances under their police powers. In others, groundwater overdraft, contamination, and other serious water management problems have forced the adjudication of groundwater basins through court or administrative proceedings and to the establishment of mandatory sustainable groundwater management criteria including "safe-yield" and replenishment obligations.

The state has tried to encourage voluntary development of locally controlled groundwater management plans through AB 3030, SB 1938, AB 303, and the Integrated Regional Water Management program (Propositions 50 and 84) and by limiting availability of state funding (bonds or state revolving fund loans) for water infrastructure only to those agencies that have these plans in place. However, local groundwater management plans are required to comply with only 6 out of the 14 plan core elements recommended by the Department of Water Resources, which means that the plans can qualify for funding without fully providing for sustainable management of the groundwater basins (Department of Water Resources 2008). Additionally, the 2009 Delta Reform Act established a voluntary program for the collection of groundwater elevation data.<sup>7</sup> The Department of Water Resources has created the California Statewide Groundwater Elevation Monitoring Program (CASGEM), which will collect groundwater elevations and make the data available online. The first reporting deadline is January 1, 2012.

Although the state has made progress in encouraging more sustainable management of groundwater, unregulated pumping and severe groundwater overdraft in some regions of California has created serious economic and environmental consequences. A recent simulation of groundwater conditions in the Central Valley for 1962–2003 estimates that groundwater storage has decreased by almost 58 million acre-feet (Faunt et al. 2009). Additionally, a recent NASA study using data from the Gravity Recovery and Climate Experiment (GRACE) satellite mission suggests that 16.5 million acre-feet were taken out of groundwater storage in the Central Valley between October 2003 and March 2010 (Famiglietti et al. 2011). The costs of chronic overdraft in terms of damage to streets, bridges, canals, and the aquifer itself resulting from subsidence, reduced groundwater availability during droughts, groundwater quality, higher pumping costs to other water users in the region, and environmental damage to streams and wildlife are significant.

Further, the state has not conducted a comprehensive assessment of California's groundwater basins using field data since Bulletin 118-80 was published in 1980—over 30 years ago. The Department of Water Resources provides an estimate of groundwater conditions, including overdraft, in Bulletin 118 updates as well as in the California Water Plan, but the numbers need to be further substantiated with current data and analysis. The Department of Water Resources is in the process of updating the California Water Plan (2013) and has initiated an effort to expand information about statewide and regional groundwater conditions and will include case studies to illustrate successful regional strategies and opportunities for conjunctive management, groundwater banking, and integrated flood management.

Information on changes in groundwater storage, as well as on groundwater overdraft, are vital to the sustainable management of California's groundwater resources and to improved reliability of the state's

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<sup>7</sup> SBx7-6 (Senate Bill 6) adds to and amends parts of Division 6 of the Water Code, specifically Part 2.11 Groundwater Monitoring. The law requires that local agencies monitor and report the elevation of their groundwater basins to help better manage the resource during average water years and drought conditions.



overall water supplies. This information is also a critical element in the CALSIM modeling used by the Department of Water Resources to evaluate State Water Project water operation scenarios and resulting environmental impact assessments. The state needs this information to sustainably manage California's groundwater resources and to improve reliability of the state's water supplies.

### **Problem Statement**

Sustainable groundwater management is needed.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

- | WR ~~R12R6~~ The Department of Water Resources, in collaboration with the U.S. Geological Survey and other federal, state and local agencies, should update Bulletin 118 using field data, California Statewide Groundwater Monitoring Elevation Monitoring (CASGEM), groundwater agency reports, satellite imagery and other best available science by January 1, 2015. This information will be available for inclusion in the Urban Water Management Plans and Agricultural Management Plans that are required to be submitted to the state by December 31, 2015.
- | WR ~~R13R7~~ To be consistent with the Delta Plan, water suppliers that deliver water diverted or exported from the Delta or the Delta watershed and that receive a significant percentage of their water supplies from groundwater sources should develop sustainable groundwater management plans that are consistent with both the required and recommended components of local groundwater management plans identified by the California Department of Water Resources (Bulletin 118, Update 2003).
- | WR ~~R14R8~~ Local and regional agencies in groundwater basins that have been identified by the Department of Water Resources as being in chronic overdraft should develop a sustainable groundwater management plan, consistent with both the required and recommended components of local groundwater management plans identified by the California Department of Water Resources (Bulletin 118, Update 2003), by January 1, 2015. If local or regional agencies fail to develop and implement these groundwater management plans, the State Water Resources Control Board should take action to determine if the continued overuse of a groundwater basin constitutes a violation of the state's Constitution Article X, Section prohibition on unreasonable use of water and whether a groundwater adjudication is needed to prevent the destruction of or irreparable injury to the quality of the groundwater.

## **Performance Measures**

- φ Improved Regional Self-Sufficiency
  - Conservation – status of progress in achieving 20 percent by 2020 and other SBx7-7 requirements
  - Local water supply development (total and by type of supply)
  - Percentage of retail water rate structures that promote water conservation
- φ ~~Reduced dependence on the Delta~~
  - Percentage of plans that identify actions that will reduce ~~are reducing~~ future dependence on the Delta watershed

- φ Improved regional water balance
  - [Whether legislation requiring Number of Urban Water Management Plans/Agricultural Water Management Plans/Integrated Regional Water Management Plans ~~that have completed to include~~ a Water Sustainability Element has been enacted, and if so how many plans include such an element and developed have a plan for achieving regional water balance](#)
- φ Improved reliability of State Water Project deliveries
  - Report in terms of long-term average reliability of the system
- φ [Improved enforcement to prevent illegal diversions within the Delta](#)
- φ [Percent of groundwater aquifers, that are used to meet urban water needs of 3,000 people or more and/or xx acres of irrigated agriculture \(consistent with AWMP requirements\), are managed or adjudicated. ~~Number of AB 3030 groundwater management plans \(with all Department of Water Resources identified requirements and recommendations\) in place~~](#)
- φ Status of Water PIE development, implementation and participation

## References

- City of Los Angeles. 2010. Draft 2010 Urban Water Management Plan.
- Department of Water Resources. 2003. California's Groundwater. Bulletin 118, Update 2003. Sacramento, CA.
- Department of Water Resources. 2009. California Water Plan Update 2009.
- Dettinger, M. D., F. M. Ralph, T. Das, et al. 2011. Atmospheric Rivers, Floods and the Water Resources of California. *Water* 3(2):445-478.
- Famiglietti, J. S., M. Lo, S. L. Lo, et al. 2011. Satellites measure recent rates of groundwater depletion in California's Central Valley. *Geophysical Research Letters*, Vol. 38, L03403.
- Faunt, C. C., K. Belitz, and R. T. Hanson. 2009. Groundwater Availability in California's Central Valley. Groundwater Availability of the Central Valley Aquifer, California. Edited by C. C. Faunt. U.S. Geological Survey Professional Paper 1766.
- Hanak, E., J. Lund, A. Dinar, B. Gray, R. Howitt, J. Mount, P. Moyle, and B. Thompson. 2011. Managing California's Water: From Conflict to Reconciliation. San Francisco, CA. Public Policy Institute of California.
- Knowles, N., and D. R. Cayan. 2002. Potential effects of global warming on the Sacramento/San Joaquin watershed and the San Francisco Estuary. *Geophysical Research Letters*, 29, 38-1-38-4.
- State Water Resources Control Board. 2008a. Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/strategic\\_plan/docs/baydelta\\_workplan\\_final.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/strategic_plan/docs/baydelta_workplan_final.pdf).
- State Water Resources Control Board. 2008b. State Water Resources Control Board and Regional Water Quality Control Board (Water Boards) Response to Second Round of Delta Vision Questions. Letter to Delta Vision Task Force, June 12, 2008.
- State Water Resources Control Board. 2010a. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem. August 3. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/docs/final\\_rpt080310.pdf](http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf).

State Water Resources Control Board, 2010b. Instream Flow Studies for the Protection of Public Trust Resources: A Prioritized Schedule and Estimate of Costs. December. [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/instream\\_recommendations/index.shtml](http://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_recommendations/index.shtml).

U.S. Bureau of Reclamation. 2011. 3404(c) CVPIA Contract Renewal Process. Site accessed April 21, 2011. <http://www.usbr.gov/mp/cvpia/3404c/index.html>.





# Chapter 5

## Restore the Delta Ecosystem

The Act defines “restoration” as “...the application of ecological principles to restore a degraded or fragmented ecosystem and return it to a condition in which its biological and structural components achieve a close approximation of its natural potential, taking into consideration the physical changes that have occurred in the past and the future impact of climate change and sea level rise” (Water Code section 85066). The Act also recognizes the value of the Delta as “... the most valuable estuary and wetland ecosystem on the west coast of North and South America” (Water Code section 85022) and provides multiple references to specific features or ecosystem function to be “protected, restored or enhanced” in meeting the coequal goals.

An overarching goal for ecosystem restoration in the Sacramento-San Joaquin Delta Reform Act is to restore fisheries and wildlife to include more viable populations of native resident and migratory species. Doing so requires consideration of the ways that native species used native Delta landscapes to meet their needs at each stage of life. Native species are populations adapted to the historical climate, hydrology, and landscape pattern of the estuary (Grossinger et al. 2010). Therefore, it is a fundamental principle that conservation of native species is promoted by restoration of landscape attributes, connections, and processes at scales that allow for full expression of native species life history strategies (Moyle et al. 2010). Restoration of the current “domesticated” Delta back to the historical, “wild” landscape is not possible, but two categories of understanding help to meet restoration goals. The first is to understand historical patterns and processes to the extent we can. The second is to apply principles of landscape ecology so that restored ecosystems have adequately scaled patterns and processes, are resilient to disturbances, and give competitive advantages to native species.

## The Historical Delta Ecosystem

The Delta was historically a 700,000-acre mosaic of variable landscape types influenced by tides and river flows (historical Delta figure from Chris Enright using Brian Atwater data). Current research shows that overall, historical Delta landscapes were spatially quite stable, but showed considerable seasonal and interannual variability in flow characteristics and inundation patterns. The historical Delta can be divided into three primary landscapes. These landscapes can be classified into (1) flood basins in the north Delta, (2) tidal islands in the central Delta, and (3) distributary rivers (multiple branches flowing away from main channels) in the south Delta (Grossinger et al. 2010; Whipple et al. 2010, 2011).

The flood basins in the north Delta occurred at the interface between fluvial (riverine) and tidally influenced portions of the Delta where the Sacramento River entered the Delta. One defining characteristic of this region was a broad zone of non-tidal, freshwater, emergent plant-dominated wetlands that graded into tidal freshwater wetlands. These wetlands were dominated by dense stands of tules. In addition, shallow perennial ponds and lakes, riparian forests along natural levees, and seasonal wetlands were common features of the historical north Delta. The historical central Delta included about 200,000 acres of tidal islands with freshwater emergent plants that were inundated regularly by spring tides (tides when differences between high and low tides are the greatest). Banks of the tidal islands were

commonly covered in tules with willows, grasses, sedges, shrubs, and ferns on the islands themselves. The historical south Delta contained a complex network of distributary channels with low natural levees, large woody debris, willows, and other shrubs with upland areas supporting open oak woodlands. Historical data from the Delta paint a picture of rich habitat complexity at multiple spatial and temporal scales (Grossinger et al. 2010; Whipple et al. 2010, 2011).

Domestication of the historical Delta landscape and ecosystem over the past 160 years has involved constructing about 1,100 miles of levees, draining the lands behind the levees for crop production, and diverting water to the southern part of the state (Hanak et al. 2011). This has produced a rich agricultural and urban economy within the Delta and far beyond its borders, but it has come at a cost to the original estuarine ecosystem and its native species. Many native species are in decline, and some are close to extinction; one fish species already extinct. More than 90 percent of wetlands have been lost to diking and draining, and floodplains in and upstream the Delta have been cut off from rivers.

Most tributary rivers flowing to the Delta have been dammed. Access to areas critical to fish lifecycles is now greatly reduced, including reaches of tributary rivers and streams critical to the state's iconic salmon. The once pronounced seasonal and interannual flow variability has made way to more stable conditions, and the formerly highly complex landscape described above has been replaced by a much more uniform landscape resembling a simplified, spatially and temporally fixed grid of (fewer) river channels used for north-south and east-west water conveyance. The channels are abruptly separated by artificial levees from dry, farmed islands and interspersed by a few large and shallow open water areas (flooded islands).

Cultivation of the peat soils also has produced subsided islands (polders) where much of the Delta is now below sea level (Lund et al. 2010). Non-native species continue to increase in the San Francisco Estuary (Cohen and Carlton 1998), and Delta fish communities continue to change in composition with native pelagic (open water) fishes undergoing a recent sharp decline (Sommer et al. 2007, Healey et al. 2008). Ecosystem restoration within the Delta landscape will not restore the historical "wild" Delta, but knowledge of the historical Delta informs managing the future by identifying what landscape elements best fit various localities where restoration projects are practical and feasible.

## Landscape Ecology

Return to the historical Delta is not possible or even desirable, because ecosystems are always responding to natural and anthropogenic drivers of change (Folke et al. 2010). This is recognized in the definition of restoration in the Act with the goal of "...close approximation of its natural potential..." (Water Code section 85066). Envisioned restoration actions, although extensive, will nevertheless cover only a fraction of the Delta and its watershed. Therefore, effective Delta restoration requires strategies to make limited available land mimic historical landscape functions sufficiently enough that native species can use them to meet their needs. In this context, landscape restoration should not be defined by its extent alone. Rather, it is more usefully defined by relationships between interacting mosaics of elements that allow energy flows between them and corridor connections that species can navigate (Wiens 2002, Lindenmayer et al. 2008). Taking a landscape perspective and applying the principles of landscape ecology focuses on three concepts (Turner 1998). The first concept is that landscape patterns and the spatial scales at which they occur determine species responses. The landscape perspective identifies and describes the agents of pattern formation, including physical processes such as hydrology, chemical processes such as nutrient cycling, biological processes such as vegetation patterns, and the ways all processes can be "disturbed" by events such as floods and droughts. Second, the landscape perspective considers broader spatial extents than those traditionally studied in ecology. The emphasis is on identifying scales that support relationships between spatial heterogeneity and the life history of native species. For example, in the Delta, the characteristic length of the tidal excursion is a spatial scale and pathway that ties together different habitat types within one-half of a tidal cycle. Third, the landscape perspective explicitly considers the role of humans in creating and affecting landscape patterns and

process. Humans play a dominant role in influencing relationships between spatial patterns and ecological processes. Indeed, the restoration goals of the Delta Plan are an example of this influence.

The landscape perspective with its focus on spatial patterns is important to resource managers because context matters. Restored landscapes have neighboring land uses, including agriculture and urban areas. Each land use affects the other because they are connected by air, land, and water; yet humans desire often conflicting services from each. In addition, ecosystem function depends on the interplay of pattern and process over broad spatial extents and, therefore, necessarily includes the role of humans in creating and affecting these relationships. Finally, understanding that human activities can dramatically alter landscape context and the relationship between patterns and processes, resource managers have a stewardship responsibility to understand and manage these impacts.

## Ecosystem Restoration

Delta ecosystem restoration involves adaptive management (see Chapter 2) of landscapes, ecosystems, habitats, communities, and species. The word “ecosystem” has many definitions. One straightforward definition is “an ecological community together with its environment, functioning as a unit.” A more scientific definition is “a community of organisms together with their physical environment, viewed as a system of interacting and interdependent relationships and including such processes as the flow of energy through trophic levels and the cycling of chemical elements and compounds through living and nonliving components of the system.” Importantly, ecosystems also include people. Whole ecosystems have been a management focus for several decades. The early term “ecosystem management” has more recently made way to the scientifically more accurate term “ecosystem-based management,” which explicitly recognizes that humans cannot control many important ecosystem attributes and, thus, cannot deliberately manipulate or manage entire ecosystems—humans can really only control and manage human activities that affect ecosystems (McLeod et al. 2005). The goal of management aimed at whole ecosystems is the long-term protection of ecological processes, structures, and interconnections needed to maintain the health, productivity, and resilience of ecosystems so that they can provide the services humans want and need (Grumbine 1994, Christensen et al. 1996, Szaro et al. 1998, McLeod et al. 2005). The concept of ecosystem restoration involves returning ecosystem processes, structures, and interconnections to a more natural or healthy condition that can be sustained over the long term.

While ecosystem-based management and restoration is concerned with the whole system, specific management actions are often aimed at individual “elements of concern” such as individual species or communities and their habitats, and on the processes that generate and sustain these elements (e.g., selection, trophic interactions, element cycling, or disturbance). Furthermore, ecosystems exist at several spatial scales, but goal-oriented ecosystem management requires the identification of geographically bounded “places of concern” that exist in a larger landscape context (Lackey 1998). What is “of concern” reflects prevailing social and economic needs and values along with scientific understanding of the ecological processes and structures that sustain them. Definition of what is “of concern” is required to set actionable management goals and targets, but ecosystem management and restoration can and should not proceed without consideration of the larger social, ecological, and landscape context.

In the Delta, places of concern include regularly wetted places such as tidal marshes, brackish water marshes, floodplains, and channel margins as well as mostly dry places such as riparian zones and open and wooded upland areas. Processes of concern include the delivery of fresh and salt water; the transport, cycling, and deposition of sediments, nutrients, and contaminants; trophic interactions; and the colonization and succession involved in building biological communities. Together, the places and processes determine the quantity and quality of habitat available to species of concern in the Delta, such as desirable native resident and migratory species or harmful non-native species, and the human inhabitants of the Delta. Ecosystem goods and services of concern include the provision of fresh water, food, recreational opportunities, cultural heritage and spiritual benefits, and water and air purification.

What then constitutes successful ecosystem restoration within the Delta? Palmer et al. (2005) propose five criteria for measuring success from an ecological perspective. First, the project should be based on a clear guiding image of the type of dynamic and healthy ecosystem to be achieved. Second, the ecological condition must be measurably improved. Third, the ecosystem should be more resilient and self-sustaining to perturbations and disturbances. Fourth, construction should produce no lasting harm. Fifth, both pre-assessment and post-assessment must be completed with public communication of results. Standards of evaluation for each of the five criteria lead to logical performance measures for restoration projects.

It is important to realize that landscapes, and the ecosystems and habitats they contain are not static; they change over time in response to numerous natural and anthropogenic drivers of change (Manning et al. 2009, Harwell et al. 2010, Delta Independent Science Board January 2011). Change is inevitable, but more resilient landscapes and ecosystems can adapt without fundamentally or overly rapidly changing how they look and function (Folke et al. 2004). The capacity for ecological resilience is increasingly challenged worldwide by global drivers such as global climate change and human population growth, as well as by drivers once considered of more local importance, for example, past and present human land use (Foster et al. 2003, Foley et al. 2005). The Delta of the future must contend with two important drivers: (1) global drivers, such as sea level rise, increasing flow variability, and changing amounts of rain and snow; and (2) key local drivers, such as land use changes, nutrient additions, legacy and emerging contaminants, and altered hydrology.

What does a changing Delta mean to the fish communities that use the Delta? Lund et al. (2010) have considered how changing habitats and various conveyance options might affect fish populations of the future Delta. Their assessment led to five main conclusions. First, large-scale ecosystem change is inevitable, and the future Delta will be very different from both the current and historical Delta. Second, variability in water quality and the flow regime is necessary to reverse the decline to desirable fish species. Third, groups of fishes (smelt, anadromous, freshwater benthic, freshwater zooplanktivores, and slough-resident fishes) are favored by differing management strategies. Fourth, any water export strategy must restore habitat diversity and function throughout the Delta and Suisun Marsh. Fifth, large-scale experimentation to optimize management strategies is needed. Improved flow regimes, greater habitat diversity, and better water quality are key characteristics for achieving a healthier Delta.

In summary, ecosystem restoration in the Delta should be based on principles of landscape ecology and ecosystem management that consider content (“elements of concern”), context (larger scale patterns and processes), the history that has resulted in the current state of the ecosystem, and tradeoffs involved with reaching envisioned “healthy” states. Successful large-scale ecosystem restoration within the Delta will be dependent on restoring key patterns, processes, and environmental conditions, including (1) creating a more natural flow regime; (2) increasing and maintaining the extent, quality, diversity, and connectivity of estuarine habitats supporting native aquatic species; and (3) reducing threats and stresses to native species and habitats. Therefore, the policies and recommendations for ecosystem restoration focus on these three key requirements.

## **Policies and Recommendations**

### **Creating a More Natural Flow Regime**

Flow is a major determinant of physical habitat and biotic composition in riverine and estuarine ecosystems such as the Delta. Native aquatic species have evolved life histories in direct response to natural flow regimes. The ecological integrity of aquatic ecosystems depends on the natural dynamic character of the ecosystems in which plants and animals have evolved (Poff et al. 1997). Flow is not simply the volume of water, but also includes the timing of flow, the frequency of specific flow conditions, the duration of various flows, and the rate of change in flows. Bunn and Arthington (2002)

present four key principles showing the links between hydrology and aquatic biodiversity and the impacts of altered flow regimes. The principles are as follows: (1) flow determines physical habitat, (2) aquatic species have evolved life history strategies based on natural flow regimes, (3) upstream-downstream and lateral connectivity are essential to organism viability, and (4) invasion and success of non-native species is facilitated by flow alterations. Altered flow regimes have been shown to be a major source of degradation to aquatic ecosystems worldwide (Petts 2009).

The California State Water Resources Control Board (State Water Resources Control Board 2010) has recently presented summary determinations regarding flow criteria for the Sacramento-San Joaquin Delta ecosystem. Some key points are as follows: (1) non-flow changes like nutrient composition, channelization, habitat, invasive species, and water quality need to be addressed along with flows, (2) flow and physical habitat interact in many ways, but they are not interchangeable, (3) percent of unimpaired flow into the Delta is one pathway for setting flow criteria, (4) more natural flows are important to migratory cues of many fish species, (5) positive changes in flow or flow patterns benefit both humans and fish and wildlife, and (6) a coordinated land use policy within the Delta is needed. Creating a more natural flow regime within the Delta is an important step in meeting the coequal goal of a healthier Delta ecosystem.

### ***Flow Regime Problem***

Altered Delta flow regimes are detrimental to native aquatic species and encourage non-native aquatic species.

### ***Policies***

ER P1     Refer to WR P4.

## **Improving Habitat**

Habitat is a fundamental ecological concept that refers to the place where an organism lives. This “place” is defined by physical, chemical, and biological variables (environmental structure and processes) that provide the conditions and resources a given organism needs to survive and reproduce—“wherever an organism is provided resources that allow it to survive, that is habitat” (Hall et al. 1997). In this definition, habitat is specific to a particular organism or species, and **habitats are species-specific components of ecosystems**. Sufficiently good habitat quantity and quality is needed to allow individuals and populations to persist. The term habitat (or “habitat type”) is also often used when referring to land cover types (e.g., open water and riparian vegetation). It is, however, important to note that land cover by itself is usually not enough to determine if the covered “place” will in fact provide good-quality habitat for a specific organism. Habitat and land cover type are not the same thing (Lindenmayer et al. 2008); an organism’s habitat is much more than land cover type, just like a person’s home is much more than a house. For example, the total area of the Delta covered by open water has not substantially changed over the last few decades, but several open water (pelagic) fish species have undergone steep declines (Sommer et al. 2007), suggesting that at least some of the open water areas in the Delta have become inhospitable to these fishes—the actual habitat available to these open water species has shrunk, even though the area covered by open water has remained fairly stable. Similarly, changing land cover patterns (e.g., increasing open water areas) does not automatically lead to increases in specific target species if detrimental conditions (e.g., poor water quality or high entrainment or predation risk) make these areas unsuitable as new habitat.

As “places,” habitats are species-specific “patches” in spatially heterogeneous landscapes. These patches are separated from surrounding areas by sharp or more gradual edges (Fischer et al. 2004) and may be connected to other similar patches by “corridors.” Landscape structure (composition and configuration) affects the abundance and distribution of habitats and the organisms they support. The occurrence and



abundance of organisms is closely associated with the total amount of usable habitat in a landscape as well as with habitat patch sizes, shapes, and arrangements (e.g., Hannon and Schmiegelow 2002). Habitats that are too small, fragmented, or isolated may not support specific organisms over the long term—they are, in effect, no longer functional habitats for these organisms. Because habitats are species specific, their necessary size, shape, and arrangement in a landscape differ among species. In general, however, more, larger, and better connected patches of a specific habitat are more likely to provide the conditions for the persistence of organisms associated with that habitat (Lindenmayer et al. 2008).

Habitat loss and fragmentation due to human land use is an important driver of worldwide species losses (Foley et al 2005). In estuaries and coastal areas, overexploitation (e.g., overfishing) and habitat destruction have been identified as the leading causes of species declines and extinctions (Lotze et al. 2006). Habitat restoration can lead to species recovery, especially when carried out in combination with the reduction of other impacts such as exploitation, predation, or pollution (Lotze et al. 2006).

**Habitat in the Delta:** The Delta is continually changing, but changes over the last 160 years have been particularly rapid and dramatic (Healey et al. 2008, Moyle et al. 2010, Baxter et al. 2010). Less than 2 centuries ago, diverse and extensive estuarine landscape features ranging from open water to tidal and seasonal wetlands and forested uplands contained a multitude of habitats that supported a productive native flora and fauna adapted to the highly variable environmental conditions of the Delta. Although the present Delta continues to be a productive ecosystem, its current landscape and habitats support a much different species assemblage than the historical Delta. Many of the currently thriving species are non-native species (Cohen and Carlton 1995). They include species considered desirable (e.g., largemouth bass, a sport fish) and undesirable (e.g., the Brazilian water weed *Egeria densa*) or even harmful (e.g., the harmful cyanobacteria *Microcystis aeruginosa*) by humans. These non-native species generally evolved in different habitats with much less variable conditions (Moyle et al. 2010). In contrast, current habitat conditions are insufficient to sustain a number of aquatic and terrestrial native species such as the fishes involved in the sudden “Pelagic Organism Decline” of the 2000s (Sommer et al. 2007, Baxter et al. 2010), as well as winter- and spring-run Chinook salmon, giant garter snake, and Suisun thistle, among others (Moyle et al. 2010; Healey et al. 2008).

## **Problem Statement**

Landscape attributes and environmental conditions have changed dramatically in the Delta and the Suisun Marsh over the last 160 years. The resultant **rapid reduction in the extent, quality, and diversity of estuarine habitats supporting native aquatic species has led to declines in populations of native resident and migratory species.** Although the Delta and the Suisun Marsh remain productive parts of the San Francisco Estuary ecosystem, their unique, native natural heritage and prized ecosystem services (e.g., the provisioning of native salmon as a food source, for recreation, and as a source of cultural, intellectual and spiritual inspiration) are in danger of being irretrievably lost.

## **Policies**

ER P2 Actions that include ecosystem restoration shall be consistent with the following sections from the *Draft Ecosystem Restoration Program’s Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010):

- ϕ map and legend of Figure 4, page 35, “Land Elevations in the Delta Ecological Management Zone will largely determine what habitat types can be accommodated,” and accompanying text on pages 33-46; and
- ϕ map and legend of Figure 5, page 47, “Map of Ecological Management Units within the Delta Ecological Management Zone,” and accompanying text on pages 46-49.

The Council may incorporate revised figures from the Ecosystem Restoration Program's Conservation Strategy as it is revised.

- ER P3 Actions other than ecosystem restoration shall determine if the action would adversely impact the opportunity for ecosystem restoration at the elevations shown in Figure 4 and in the Ecological Management Units shown in Figure 5, and as explained in the accompanying text of those figures. These actions shall demonstrate that any such adverse impacts will be fully avoided or minimized. Certification of consistency associated with these actions shall consider the habitat values described generally in Section 2 of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010) and subsequent revisions of this document.
- ER P4 Protection of floodplains in the Delta and Delta watershed is critical for achieving the coequal goals, reducing flood risk, and preserving the unique character of the Delta. For actions outside the Delta, this policy is a recommendation. To be consistent with the Delta Plan:
- ϕ Actions affecting floodplains in the Delta or in the Delta watershed must demonstrate that impacts on the potential for ecosystem restoration or flood management have been fully considered and avoided or minimized.
  - ϕ Actions shall demonstrate that they would maintain or expand remaining large blocks of intact habitat or natural landscape, including floodplains, as described in the California Essential Habitat Connectivity Project (Department of Transportation and Department of Fish and Game 2010).
  - ϕ State and local agencies constructing new levees, substantially rehabilitating or reconstructing existing levees in the Delta and Delta watershed shall evaluate and incorporate alternatives (including use of setback levees) that would increase the extent of floodplain and riparian habitats.
- ER P5 New or amended local or regional land use plans shall not substantially reduce opportunities for ecosystem restoration, habitat creation, channel modification for ecosystem benefit, or increased connectivity between water and land; or direct such uses away from their most effective locations as identified in the maps, legends and accompanying text of Figures 4 and 5 of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (California Department of Fish and Game 2010).

## **Recommendations**

- ER R1 The Council acknowledges the importance of expediting habitat restoration in the Delta, and recommends the prioritization and implementation of restoration projects in the following areas:
- ϕ Yolo Bypass
  - ϕ Cache Slough Complex
  - ϕ Lower San Joaquin River Floodplain
  - ϕ Suisun Marsh
  - ϕ Cosumnes River/Mokelumne River Confluence

The Council shall develop a restoration strategy and suite of specific actions for habitat restoration in the priority areas and throughout the Delta to meet the objectives defined in Water Code 85022(d) and 85302(e). Specific measures shall be incorporated



in the Delta Plan for the development of new or improved habitat, protection of existing habitat, and to facilitate the restoration of large areas of interconnected habitat within the Delta and its watershed.

ϕ

ER R2 As part of its Strategic Plan, the Delta Conservancy should:

- ϕ Develop and adopt criteria for prioritization and integration of large-scale ecosystem restoration in the Delta, with sustainability and use of best available science as foundational principles.
- ϕ Develop and adopt methods and processes for ownership and long-term operations and management of restored and/or conserved land in the Delta and Suisun Marsh.
- ϕ Recommend sources for long-term financing for programs and projects that include covering costs of long-term operations and management and “Payment in Lieu of Taxes.”
- ϕ Develop and adopt a formal mutual agreement with the Department of Water Resources, Department of Fish and Game, federal interests, and other State and local agencies on implementation of ecosystem restoration.
- ϕ Develop in conjunction with the Wildlife Conservation Board, the Department of Water Resources, Department of Fish and Game, and other State and local agencies, a plan and protocol for acquiring the land necessary to achieve ecosystem restoration consistent with the coequal goals and the *Draft Ecosystem Restoration Program’s Conservation Strategy*.

## Reducing Threats and Stresses

Ecosystem restoration cannot succeed in the face of persistent threats to the well-being of the habitats and species it seeks to restore. The current degraded habitat conditions for many native Delta species are the result of the combined impacts of multiple drivers and stressors, including physical and chemical habitat degradation, increased mortality from entrainment into water diversions and from predation, and insufficient food resources (Sommer et al. 2007, Baxter et al. 2010, Delta Independent Science Board January 2011). Expected climate change impacts (e.g., higher temperatures) will likely further degrade native species habitat in the Delta, while benefitting many non-native species. Successful recovery of native species requires aggressive habitat restoration aimed at increasing the extent, quality (including connectivity), and diversity of native species habitats, and improvement of habitat conditions through reduction of multiple threats and stresses on native species habitats. Conversely, invasive species can only be successfully controlled by the reduction of habitat conditions that favor these species over native species.

### **Problem Statement**

Habitat suitable for non-native invasive species has increased in the Delta and the Suisun Marsh, and many non-native species are now thriving. New species continue to arrive every year. **Although some key non-native species are considered desirable by humans, others are undesirable or harmful.** None of these species is part of the unique native natural heritage of the Delta and the Suisun Marsh, but some have been here for more than a century and have become an integral part of this ecosystem.

### **Policies**

ER P6 Actions shall demonstrate that the potential for new introductions of or improved habitat conditions for non-native invasive species have been fully considered and avoided or minimized in a way that appropriately protects the ecosystem.

## Recommendations

ER R3 Pending development and adoption of an invasive species management plan for the Delta, the Department of Fish and Game should fully implement the following sections of the *Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone (Department of Fish and Game 2010)*:

- φ List of "Potential Stage 2 Actions for Non-Native Invasive Species" on p. 54; and
- φ Text in section "III.B. Invasives" on pages 53-58.

ER R4 By January 1, 2013 the Delta Science Program, in conjunction with the Department of Fish and Game, the Department of Water Resources and other relevant agencies should conduct workshops with the objective of providing specific recommendations to the Council for measures to minimize stressor impacts on the Delta ecosystem and on the prioritization of such measures.

## Bay Delta Conservation Plan

The Bay Delta Conservation Plan ([BDCP](#)) is a 50-year plan being prepared through a collaboration of State, federal, and local water agencies, State and federal resource agencies, environmental organizations, and other interested parties. [The BDCP is being developed in compliance with federal and state endangered species acts to help restore fish and wildlife species and provide for the protection and restoration of water supplies while minimizing impacts to Delta communities and farms.](#) It will be incorporated into the Delta Plan if it meets the requirements of Water Code section 85320, including the approval by the Department of Fish and Game of the Bay Delta Conservation Plan as a natural community conservation plan and its approval as a habitat conservation plan pursuant to the federal Endangered Species Act. [The BDCP seeks to improve the Delta ecosystem through a comprehensive approach to addressing species needs and ecological processes. The plan will include a scientifically-based adaptive management program to ensure incorporation of new scientific information into decisions on water management and conservation measures.](#)

## Problem Statement

The Bay Delta Conservation Plan is expected to significantly ~~affected~~[advance](#) the coequal goals required by the Delta Reform Act. [BDCP proposed measures to address ecosystem restoration, water conveyance, and reduce stressors to native species would contribute to meeting the following Delta Plan recommendations: ER1, ER2, ER3 and WR R3.](#) The Bay Delta Conservation Plan [is a voluntary process that requires the approval of multiple public agencies prior to adoption.](#) The BDCP planning process has been under way since 2006, but the plan ~~will~~[may](#) not be completed prior to adoption of the Delta Plan in 2012.

## Recommendations

ER R5 ~~The involved federal, State, and local agencies should complete the Bay Delta Conservation Plan process (i.e., receive required incidental take permits) consistent with the Delta Reform Act no later than December 31, 2014.~~ [The Council should monitor the progress of the Bay Delta Conservation Plan. Once the BDCP is finalized and if it is incorporated into the Delta Plan consistent with Water Code section 85320, the Council, Conservancy, and BDCP should coordinate on efficiently implementing adopted actions to achieve the co-equal goals. If the Bay Delta Conservation Plan process is not completed by this date consistent with the Delta Reform Act, the Council will proceed with ecosystem stressor reduction actions identified in the Delta Plan and conveyance planning recommendations independently of the Bay Delta Conservation Plan process for inclusion in the first five year update of the Delta Plan.](#)

# Performance Measures

Performance measures derive from the goals and objectives in the Act and from requirements for largescale ecosystem restoration within the Delta. The performance measures should address progress in achieving each of the following objectives in the Act:

85302(c) The Delta Plan shall include measures that promote all of the following characteristics of a healthy Delta ecosystem.

- (1) Viable populations of native resident and migratory species.
- (2) Functional corridors for migratory species.
- (3) Diverse and biologically appropriate habitats and ecosystem processes.
- (4) Reduced threats and stresses on the Delta ecosystem.
- (5) Conditions conducive to meeting or exceeding the goals in existing species recovery plans and state and federal goals with respect to doubling salmon populations.

85302(e) The following subgoals and strategies for restoring a healthy ecosystem shall be included in the Delta Plan.

- (1) Restore large areas of interconnected habitats within the Delta and its watershed by 2100
- (2) Establish migratory corridors for fish, birds, and other animals along selected Delta river channels.
- (3) Promote self-sustaining, diverse populations of native and valued species by reducing the risk of take and harm from invasive species.
- (4) Restore Delta flows and channels to support a healthy estuary and other ecosystems.
- (5) Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals.

(6) *Restore habitat necessary to avoid a net loss of migratory bird habitat and, where feasible, increase migratory bird habitat to promote viable populations of migratory birds.*

Performance measures derived from these objectives can be grouped as follows:

## Species Performance Measures:

- φ Progress toward achieving viable populations of native resident and migratory species or species groups
- φ Progress toward achieving recovery for listed species in the Delta
- φ Progress toward achieving the state and federal "doubling goal" for wild, Central Valley anadromous fishes

## Flow Performance Measures:

- φ Successful adoption of criteria for Delta inflows and outflows by January 2, 2014, and the adoption of flow criteria for the major tributary rivers to the Delta by January 2, 2018
- φ Progress toward meeting adopted Delta inflow and outflow criteria and major tributary flow criteria

## Habitat and Migratory Corridor Performance Measures:

- φ Progress toward developing new or improved aquatic and terrestrial habitat, and documented use of these habitats by key species

- φ Progress toward protecting existing habitats and documented use of these habitats by key species
- φ Progress toward restoring large areas of interconnected habitats for native resident and migratory species in the Delta and its watersheds by 2100
- φ Acres of habitat conserved for native resident and migratory species in the Delta
- φ Progress toward achieving diverse and biologically appropriate habitats and ecosystem processes
- φ Progress toward restoring habitat that is necessary to avoid a net loss of migratory bird habitat
- φ Quantity of permanent or appropriate seasonal connectivity along all major migratory routes to allow adequate migration between native fish spawning, rearing, and migration habitat
- φ Quantity of contiguous corridors for migration of fish and birds, and documented use of these corridors by key species
- φ Rates of key processes (e.g., primary production, decomposition, nutrient uptake, and respiration) in restored habitats compared to non-restored habitats

Threat and Stressor Performance Measures:

- φ Progress toward reducing numbers and proportion of native resident and migratory species (as larvae, juveniles, or adults) taken at water diversion points
- φ Progress toward decreasing annual trend in number of new, uncontrolled harmful invasive species
- φ Progress toward decreasing abundance and distribution of harmful invasive aquatic and terrestrial species
- φ Reduced concentrations of nutrients (nitrogen and phosphorus compounds) that support the growth of undesirable algae or excessive growth of nuisance aquatic plants

## References

- Baxter, R., R. Breuer, L. Brown, L. Conrad, F. Feyrer, S. Fong, K. Gehrts, L. Grimaldo, B. Herbold, P. Hrodey, A. Mueller-Solger, T. Sommer, and K. Souza. 2010. Interagency Ecological Program 2010 Pelagic Organism Decline Work Plan and Synthesis of Results. Interagency Ecological Program for the San Francisco Estuary.
- Bunn, S. E., and A. H. Arthington. 2002. Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity. *Environmental Management* 30:492-507.
- California Department of Fish and Game. 2010. Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone.
- California Department of Transportation and California Department of Fish and Game. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving and Connected California. February.
- Christensen, N. L., A. Bartuska, J. H. Brown, S. Carpenter, C. D'Antonio, R. Francis, J. F. Franklin, J. A. MacMahon, R. F. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. G. Moodmansee. 1996. The report of the Ecological Society of America Committee on the scientific basis for ecosystem management. *Ecological Applications*. 6:665-691.

- Cohen, A. N., and J. T. Carlton. 1998. Accelerating invasion rate in a highly invade estuary. *Science* 279:555-559.
- Dennison, W. C, R. J. Orth, K. A. Moore, J. C. Stevenson, V. Carter, S. Kollar, P. W. Bergstrom, and R. A. Batiuk. 1993. Assessing water quality with submersed aquatic vegetation. *BioScience* 43:86-94.
- Fischer, J., D. B. Lindenmayer, and I. Fazey. 2004. Appreciating ecological complexity: habitat contours as a conceptual landscape model. *Conservation Biology* 18:1245–1253.
- Foley, J. A., R. DeFries, G. P. Asner, C. Barford, G. Bonan, S. R. Carpenter, et al. 2005. Global consequences of land use. *Science* 309:570–574.
- Folke, C., S. Carpenter, B. Walker, M. Scheffer, T. Elmqvist, L. Gunderson, and C. S. Holling. 2004. Regime shifts, resilience, and biodiversity in ecosystem management. *Annual Reviews in Ecology Evolution and Systematics* 35:557–581.
- Foster, D., F. Swanson, J. Aber, I. Burke, N. Brokaw, D. Tilman, and A. Knapp. 2003. The importance of land-use legacies to ecology and conservation. *BioScience* 53:77–88.
- Grossinger, R. M., A. A. Whipple, J. C. Collins, and D. Rankin 2010. Historical Delta landscapes: Conceptual models for building a diverse and resilient future. Bay Delta Science Conference Abstract. Sacramento, CA.
- Grumbine, R. E. 1994. What Is Ecosystem Management? *Conservation Biology* 8:27-38.
- Hanak, E., J. Lund, A. Dinar, B. Gray, R. Howitt, J. Mount, P. Moyle, B. Thompson. 2011. Managing California's Water: From Conflict to Reconciliation. Public Policy Institute of California: San Francisco, CA.
- Hall, L. S., P.A. Krausman,. and M. L. Morrison. 1997. The habitat concept and a plea for the use of standard terminology. *Wildlife Society Bulletin* 25:173–182.
- Hannon, S. J., and F. Schmiegelow. 2002. Corridors may not improve the conservation value of small reserves for most boreal birds. *Ecological Applications* 12:1457–1468.
- Harwell, M. A., J. H. Gentile, K. W. Cummins, R. C. Highsmith, R. Hilborn, C. P. McRoy, J. Parrish, and T. Weingartner. 2010. A conceptual model of natural and anthropogenic drivers and their influence on the Prince William Sound, Alaska, ecosystem. *Human and Ecological Risk Assessment* 16:672-726.
- Healey, M. C., M. D. Dettinger, and R. B. Norgaard, eds. 2008. The State of Bay-Delta Science, 2008. CALFED Science Program: Sacramento, CA.
- Hudson, P. L., R. W. Griffiths, and T. J. Wheaton. 1992. Review of habitat classification schemes appropriate to streams, rivers, and connecting channels in the Great Lakes drainage basin. The Development of an Aquatic Habitat Classification System for Lakes. W. D. N. Busch and P. G. Sly, editors. Pp 73107. CRC Press: Ann Arbor, MI.
- Kareiva, P., et al. 2007. Domesticated nature: shaping landscapes and ecosystems for human welfare. *Science* 316:1866-1869.
- Lindemayer, D., R. Hobbs, J. Miller, et al. 2008. A checklist for ecological management of landscapes for conservation. *Ecology Letters* 11:78-91.

- Lotze, H. K., H. S. Lenihan, B. J. Bourque, R. H. Bradbury, R. G. Cooke, M. C. Kay, S. M. Kidwell, M. X. Kirby, C. H. Peterson, and J. B. C. Jackson. 2006. Depletion, degradation, and recovery potential of estuaries and coastal seas. *Science* 312:1806–1809.
- Lund, J. R., E. Hanak, W. E. Fleenor, W. A. Bennett, R. E. Howitt, J. F. Mount, and P. B. Moyle. 2010. Comparing Futures for the Sacramento-San Joaquin Delta. Freshwater Ecology Series. University of California Press: Berkeley, CA.
- Manning, A. D., J. Fischer, A. Felton, B. Newell, W. Steffen and D. B. Lindenmayer. 2009. Landscape fluidity – a unifying perspective for understanding and adapting to global change. *Journal of Biogeography* 36:193–199.
- McLeod, K. L., J. Lubchenco, S. R. Palumbi, and A. A. Rosenberg. 2005. Scientific Consensus Statement on Marine Ecosystem-Based Management. Signed by 221 academic scientists and policy experts with relevant expertise. Communication Partnership for Science and the Sea. <http://compassonline.org/?q=EBM>.
- Moyle, P. B., W. A. Bennett, W. E. Fleenor, and J. R. Lund. 2010. Habitat variability and complexity in the upper San Francisco Estuary. *San Francisco Estuary and Watershed Science*. Volume 8, Issue 3.
- Osborne, L. L., and D. A. Kovacic. 1993. Riparian vegetated buffer strips in water-quality restoration and stream management. *Freshwater Biology* 29:243-258.
- Palmer, M. A., E. S. Bernhardt, J. D. Allan, P. S. Lake, G. Alexander, S. Brooks, J. Carr, S. Clayton, C. N. Dahm, J. Follstad Shah, D. L. Galat, S. Gloss, P. Goodwin, D. H. Hart, B. Hassett, R. Jenkinson, G. M. Kondolf, R. Lave, J. L. Meyer, T. K. O'Donnell, L. Pagano, P. Srivastava, and E. Sudduth. 2005. Standards for ecologically successful river restoration. *Journal of Applied Ecology* 42:208217.
- Petts, G. E. 2009. Instream flow science for sustainable river management. *Journal of the American Water Resources Association* 45:1071-1086.
- Poff, N. L., J. D. Allan, M. B. Bain, J. R. Karr, K. L. Prestegard, B. D. Richter, R. E. Sparks, and J. C. Stromberg. 1997. The natural flow regime. *BioScience* 47:769-784.
- Sommer, T., C. Armor, R. Baxter, R. Breuer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W. Kimmerer, A. Mueller-Solger, M. Nobriga, and K. Souza. The collapse of pelagic fishes in the Upper San Francisco Estuary. *Fisheries* 32:270-277.
- State Water Resources Control Board. 2010. Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem. California Environmental Protection Agency, Sacramento, CA.
- Swetnam, T. W., C. D. Allen, and J. L. Betancourt. 1999. Applied historical ecology: Using the past to manage for the future. *Ecological Applications* 9:1189-1206.
- Szaro, R., W. T. Sexton, and C. R. Malone. 1998. The emergence of ecosystem management as a tool for meeting people's needs and sustaining ecosystems. *Landscape and Urban Planning* 40:1-7.
- Whipple, A. A., R. M. Grossinger, J. C. Collins, and D. Rankin. 2010. The historical Yolo Basin landscape: What parts make the whole? Bay Delta Science Conference Abstract. Sacramento, CA.
- Whipple, A. A. 2011. [http://www.afs-calneva.org/\\_files/Cal-Neva\\_AFS\\_Conf\\_2011\\_Abstracts.pdf](http://www.afs-calneva.org/_files/Cal-Neva_AFS_Conf_2011_Abstracts.pdf).



AGENDA ITEM 7  
APPENDIX A  
THIRD STAFF DRAFT DELTA PLAN



# **Chapter 7**

## **Reduce Risk to People, Property, and State Interests in the Delta**

Water Code sections 85305, 85306, 85307, and 85309 require the Delta Plan to include specific objectives.

85305. *(a) The Delta Plan shall attempt to reduce risks to people, property, and state interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments.*

*(b) The council may incorporate into the Delta Plan the emergency preparedness and response strategies for the Delta developed by the California Emergency Management Agency pursuant to Section 12994.5.*

85306. *The council, in consultation with the Central Valley Flood Protection Board, shall recommend in the Delta Plan priorities for state investments in levee operation, maintenance, and improvements in the Delta, including both levees that are a part of the State Plan of Flood Control and non-project levees.*

85307. *(a) The Delta Plan may identify actions to be taken outside of the Delta, if those actions are determined to significantly reduce flood risks in the Delta.*

*(b) The Delta Plan may include local plans of flood protection.*

*(c) The council, in consultation with the Department of Transportation, may address in the Delta Plan the effects of climate change and sea level rise on the three state highways that cross the Delta.*

*(d) The council, in consultation with the State Energy Resources Conservation and Development Commission and the Public Utilities Commission, may incorporate into the Delta Plan additional actions to address the needs of Delta energy development, energy storage, and energy transmission and distribution.*

Based upon Water Code Section 85309, the Council shall consider a proposal from the Department of Water Resources, in consultation with the Corps of Engineers and the Central Valley Flood Protection Board, to coordinate flood and water supply operations of the State Water Project and the federal Central Valley Project.

# Chapter 7

## Reduce Risk to People, Property, and State Interests in the Delta

### Introduction

The Delta is an inherently flood-prone area at the confluence of two massive watersheds. The watersheds of the Sacramento and San Joaquin Rivers collectively drain approximately 43,000 square miles. What was historically a tidal marsh formed through the interaction of fluctuating sea levels and an influx of alluvial sediments from river floods has been transformed. It is now a complex labyrinth of reclaimed islands and waterways created through the construction of levees, many of which were constructed over the past 150 years using light equipment and local, uncompacted sediments and organic matter, and with little or no foundation preparation.

The Delta (the legal Delta and Suisun Marsh) includes more than 1,335 miles of levees that protect approximately 839,610 acres of land. These levees face potential threats such as large runoff events, earthquakes, extreme high tides, wind-generated waves, subsidence, and sea level rise. Individually, each of these threats is enough to cause serious concern; together, they represent a potential for catastrophic disruption of the Delta. A mass failure of the levee system would have real life-and-death impacts, and property losses that could total billions of dollars. Levee failures not only create direct damage and potential loss of life from flooding, but also change the configuration of the Delta—both water and land—and alter the mixing of fresh water with salt water. A failure could also have significant effects on California's economy from interruption of service to 25 million urban water users and to approximately 3 million acres of irrigated farmland that depend, in part, on water conveyed through the Delta.

The portfolio of [economically and ecologically based](#) risk-reduction strategies must consider urban and rural communities as well as agricultural lands in the process of identifying evaluating, and prioritizing investments in the levee system. Risks can be reduced through an emergency preparedness, response, and recovery system; appropriate land uses; [land acquisition and conversion to ecosystem functions](#); [subsidence reversal strategies](#); and strategic levee improvements.

Flood risk is assessed in terms of the likelihood of a flood event occurring, the chance of failure from that flood event, and the associated consequences. Consequences can entail loss of life and economic and environmental damage. Risk of flooding in the Delta is likely to increase over time as a result of several factors: continued development within the floodplains, inadequate levees, inadequate channel capacities, seismic vulnerability, continuing subsidence, climate change, and sea level rise. It is estimated that by the year 2100, sea level rise may reach 55 inches (California Climate Action Team 2010, California Ocean Protection Council 2011). Failure of significant parts of the Delta's [current](#) flood management system will be unavoidable. [Given that failures will occur, decisions regarding the prioritization of all future risk reduction measures and costs must be made on the basis of economically, socially and ecologically](#)

justified analyses. Wise public policy calls for the matching of sustainable land uses to levee standards or other risk reduction measures based upon sound economic, social and ecosystem justifications.

Flood risk reduction cannot absolutely prevent harmful inundation from floods, but can reduce its likelihood and social and economic impacts. History has shown that unavoidable structural failures in the system will occur as a result of extraordinary events, imperfect knowledge, and imperfect materials. Risks must be well understood, and then managed and controlled to the extent possible through public awareness, adequate emergency management planning, and enforcement of existing flood management regulations. Many studies and efforts addressing flood management and emergency preparedness, response, and mitigation are underway, and will be considered by the Council for ongoing Delta flood risk management. These studies include the Central Valley Flood Protection Plan, FloodSAFE, and the U.S. Army Corps of Engineers Delta Islands Levees Feasibility Study, the Long Term Management Strategy for Dredging, periodic inspection system, and levee safety action classification system. Once the critical economic, social and ecosystem justifications have been made, the Delta Plan will consider the findings of these studies to guide the Council in implementing its policies and making determinations of consistency. Furthermore, new efforts are needed to match long-term Delta ecosystem plans with economically based risk reduction actions.

This chapter presents economically based risk-reduction policies and recommendations necessary for the achievement of the coequal goals.

## Floodplain and Floodway Protection

Adequate flood flow capacity is critical for managing flood risks to upstream, adjacent, and downstream land uses, and for overall Delta water management and ecosystem integrity. Both the Federal Emergency Management Agency (FEMA) and the State Central Valley Flood Protection Board play a role in designating floodways to accommodate flood flows. “Designated Floodway” refers to the channel of the stream and that portion of the adjoining floodplain reasonably required to provide for the passage of a design flood; it is also the floodway between existing levees as adopted by the Central Valley Flood Protection Board or the Legislature.

The State Central Valley Flood Protection Board, under Section 8609 of the Water Code, has the authority to designate floodways in the Central Valley. Title 23 of California Code of Regulations provides further details of the Board’s regulatory authority; specifically, Article 5, Section 107, regulates land uses in Designated Floodways. Under the National Flood Insurance Program, FEMA establishes regulatory floodways, and participating communities are expected to regulate development within their floodways in accordance with the regulations defined primarily by federal regulations.<sup>1</sup>

Despite these regulations, land use policies guiding development in floodways are not consistent across Delta counties. Additionally, floodways have not been established for many of the channels within the Delta by either FEMA or the State Central Valley Flood Protection Board. In light of these problems, the Delta Plan should address these issues and highlight the need for policies and recommendations that accommodate floodplain and floodway protection. Concerns that floodways may expand and deepen as a consequence of sea level rise and changes to rainfall and snow patterns over the next 100 years must be

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<sup>1</sup> 44 Code of Federal Regulations 60.3(b)(6,7,10) requires the following:

- *Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Administrator;*
- *Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;*
- *Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community’s Flood Insurance Rate Map (FIRM), unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.*

addressed and accommodated. Development in existing or future floodplain or bypass locations in the Delta or upstream can permanently eliminate the availability of these areas for future floodplain usage.

### **Problem Statement**

Structures constructed in the floodway that encroach on existing floodplains and potential future floodplain or bypass locations in the Delta and upstream could reduce the flood carrying capacity of the Delta.

### **Policies**

RR P1 Refer to ER P4.

RR P2 Existing or potential value of floodways<sup>2</sup> or potential floodways shall not be encroached<sup>3</sup> upon nor diminished without mitigating for potential or future flood flows, except as provided in this Delta Plan.

RR P3 Existing or potential value of floodplains<sup>4</sup> or potential floodplains shall not be encroached upon nor diminished except as provided in this Delta Plan. The following areas are identified in the Delta Plan as potential floodplains and should also provide ecosystem benefit:

- φ Areas located in the Yolo Bypass from Fremont Weir through Cache Slough to the Sacramento River outside of the existing floodplain easement, including the confluence of Putah Creek into the bypass;
- φ The Cosumnes River/Mokelumne River confluence, as defined by the North Delta Flood Control and Ecosystem Restoration Project (Department of Water Resources 2010);
- φ The San Joaquin River/South Delta Floodplain. This area extends north from the southern boundary of the legal Delta, including all of Pescadero Tract, Paradise Cut and Reclamation Districts R-2075, R-2064, R-2085, R-2094, R-2095, the portion of R-1007 generally north of Bethany Road and the portion of R-2058 north of Interstate 205, and the undeveloped portion of Stewart Tract. This area will be modified upon completion of studies by the Department of Water Resources that will define the floodplain as referenced in Water Code section 9613(c).

### **Recommendation**

RR R1 The Legislature should fund and the Department of Water Resources and the Central Valley Flood Protection Board should complete their investigation of the bypass and floodways in the San Joaquin River to reduce potential flooding near Paradise Cut, as required by Water Code section 9613(c).

RR R2 The current efforts led by the U.S. Army Corp of Engineers—the *San Francisco Bay Long Term Management Strategy for Dredging and the Delta Dredged Sediment Long-Term Management Strategy*—should be continued and supported so that desirable dredging to support the Delta Plan and the coequal goals, might be achieved. Appropriate dredging might

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<sup>2</sup> As defined by California Code of Regulations, Title 23, Division 1, Chapter 1, Article 2, Section 4: (n) Floodway. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that convey flood waters.

<sup>3</sup> As defined by California Code of Regulations, Title 23, Division 1, Chapter 1, Article 2, Section 4: (m) Encroachment. "Encroachment" means any obstruction or physical intrusion by construction of works or devices, planting or removal of vegetation, or by whatever means for any purpose, into any of the following: (1) any flood control project works; (2) the waterway area of the project; (3) the area covered by an adopted plan of flood control; or (4) any area outside the above limits, if the encroachment could affect any of the above.

<sup>4</sup> As defined by the FEMA National Flood Insurance Program: *Floodplain: Any land area susceptible to being inundated by flood waters from any source.* <http://www.fema.gov/business/nfip/19def2.shtm>.

increase flood conveyance while at the same time acquiring material which might be used for levee maintenance (U.S. Army Corps of Engineers 2002).

## Delta Levee Design Criteria

The 1992 Delta Protection Act designated the Delta as a flood-prone area and defined the most appropriate land uses as agriculture, wildlife habitat, and where specifically provided, recreation (Public Resources Code section 29704). Although levees were constructed in the Delta to reduce the risk of flooding, the historical performance of many levees in the Delta is poor. Many levee failures have been attributed to high flood flows, and some levees have failed in the absence of any type of flood. If a significant earthquake does occur on faults near the western Delta, one or more levees could fail or subside (Department of Water Resources 2009). With this in mind, it is more important than ever that the levees in the Delta are designed, constructed, and maintained to provide the level of flood risk reduction commensurate with the ~~land and~~ economic and ecological resource uses they protect on an island by island basis.

As discussed in Delta Vision, the level of flood protection provided by levee classifications should be related to an acceptable risk for the types of land use located behind the levee (Delta Vision Blue Ribbon Task Force 2008). A classification system is needed that aligns levee design with corresponding appropriate land and resource uses, ranging from habitat or ecosystem protection up to protection of large urban areas comprising thousands of people and homes. During the last few decades, state and federal agencies have developed various levee standards. These standards were designed to either establish minimum criteria that would make the levees and the properties protected eligible for grants or rehabilitation funds, or minimum criteria that would allow development behind the levees. While there is a significant history associated with these standards, none are economically based nor do they consider the ecological goals for tidal marsh restoration. Hence, new standards need to be developed expeditiously by the Federal and State agencies. Currently, ~~the~~ the four most prominent existing island levee standards are listed below:

- φ **FEMA Hazard Mitigation Plan:** Meeting this standard allows the Delta island or tract to be eligible for FEMA disaster grants and assistance following levee failures and island inundation.
- φ **USACE Public Law 84-99:** Meeting this standard allows the Delta island or tract to be eligible for USACE funding for levee rehabilitation and island restoration following levee failures and island inundation, provided the reclamation district applies for and is accepted into the program and passes a rigorous initial inspection and periodic follow-up inspections. Both of the above two standards are based primarily on levee geometry with minimum freeboard and maximum steepness of slopes. Although the geometry implies a minimum slope stability factor of safety, neither standard is associated with a level of protection and neither addresses seismic stability.
- φ **FEMA 100-year (Base Flood) Protection:** This standard, often called the 1 percent annual chance flood level of protection, is based on criteria established in the Code of Federal Regulations and is often used with established USACE criteria to meet certain freeboard, slope stability, seepage/underseepage, erosion, and settlement requirements. Meeting this level of flood protection means that communities will not require mandatory purchase of flood insurance or be subject to building restrictions. This standard generally does not address seismic stability. Very few levees in the central Delta meet this standard.
- φ **DWR 200-year Urban Levee Protection:** This standard is similar to the FEMA standard, but for a 200-year level of flood protection. It is generally based on established USACE criteria. However, unlike USACE criteria, the DWR 200-year Urban Levee Protection requires that seismic stability be addressed. Not meeting this standard, or making adequate progress toward it, will generally prohibit further development behind an urban or urbanizing levee. Although almost

none of the levees in the central Delta meets this standard, most do not protect urban areas, with the exceptions of the outer fringes of the Delta near West Sacramento, Sacramento's Pocket Area, and Stockton.

It is likely more useful to properly align [economic land](#) and resource uses with specific [island](#) levee design criteria. This can help ensure that land and resource uses realize appropriate flood risk protection, but also signal that future alterations and changes to land and resource uses must remain in alignment with appropriate [ecosystem goals, economic sustainability and risk reduction-levee design](#) criteria. To that end, this section provides policies that address the alignment of land and resource uses with appropriate levee design criteria.

While most of the attention is typically directed toward flood risk reduction for life and property, [future efforts must be based upon economically based risk reduction measures which consider future drivers of change and flood protection is also a consideration for habitat](#) and ecosystem values and goals. Among other considerations, setback levees that expand flood conveyance capacity and reduce flood risk while providing ecosystem restoration and recreational opportunities are worthwhile (U.S. Army Corps of Engineers 2002).

### Problem Statement

[The status of many Delta levees condition to meet economic, social and ecological public needs cannot be assessed until further analyses are completed and a new levee classification system is established. are not adequately designed and/or maintained to protect the existing land and resource uses.](#)

### Policies

RR P4 [Once a new levee classification system has been established, A](#)ctions occurring after January 1, 2015 shall conform to the classifications defined in Table 71. Actions protected by Class 5 levees must conform by 2025 in accordance with the Central Valley Flood Protection Act of 2008 (Government Code section 65865.5(a)(3)).

**Table 7-1**  
**Levee Classifications for Land and Resource Uses**

Levee System Goals							Minimum Design Criteria
Levee System Classification	Description	Land Use					
		Wetlands/ Habitat	Agricultural	Infrastructure	Rural Residential Uses with less than 10,000 people <sup>c</sup>	Urban Residential Uses with more than 10,000 people <sup>c</sup>	
Class 1	No specific goal <sup>a</sup>	✓	NA	NA	NA	NA	Designed to manage the flood risk to the level appropriate for individual ecosystem restoration projects.
Class 2 <sup>b</sup>	HMP	✓	✓	NA	NA	NA	Current DWR nonurban levee design criteria.
Class 3	PL84-99	✓	✓	✓	NA	NA	Current DWR nonurban levee design criteria.
Class 4	FEMA – 100-year	✓	✓	✓	✓ <sup>d</sup>	NA <sup>d</sup>	Current DWR nonurban levee design criteria, and must be accredited by FEMA as providing protection from the 100-year flood event.



**Table 7-1**

**Levee Classifications for Land and Resource Uses**

Levee System Goals						Minimum Design Criteria
Levee System Classification	Description	Land Use				
		Wetlands/ Habitat	Agricultural	Infrastructure	Rural Residential Uses with less than 10,000 people <sup>c</sup>	Urban Residential Uses with more than 10,000 people <sup>c</sup>
<b>Class 5</b>	DWR – 200-year <sup>e</sup>	✓	✓	✓	✓ <sup>d</sup>	✓ <sup>d</sup>
Current DWR urban levee design criteria for the 200–year flood event. and must be accredited by FEMA as providing protection from the 100-year flood event						

Notes:

NA: Denotes Not Acceptable

✓: Denotes Acceptable

HMP: Hazard Mitigation Plan. FEMA geometrical levee criteria.

PL84-99: Public Law 84-99 standards developed by the US Army Corps of Engineers.

FEMA-100-year: Levees accredited by FEMA as providing 100 year flood protection.

<sup>a</sup> Class 1 levees are designed to serve the need of the habitat, and may be allowed to periodically fail.

<sup>b</sup> Islands where Class 2 levees are appropriate include those, after adequate consideration, that are judged to have no specific Statewide interest and may not be reclaimed after a levee failure.

<sup>c</sup> Levee protection for legacy towns should be determined based on site specific needs (e.g., floodwalls) and financing available.

<sup>d</sup> Levees for areas with residential, commercial, and industrial businesses should comply with requirements contained in the Natural Resources Agency "Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento-San Joaquin Valley," and ultimately upgrade to at least Class 5 (Federal Emergency Management Agency 200-year).

<sup>e</sup> In accordance with the Central Valley Flood Protection Act of 2008 (Senate Bill 5, Machado)

**RR P5** Until the Department of Water Resources adopts criteria to define locations for future setback levees, any action located next to the land side of a levee shall demonstrate adequate area is provided to accommodate setback levees, as determined by a registered civil engineer or geologist.

## Flood Management Investment

The Delta is inherently flood-prone, but its levees protect its residents, its agricultural land, and energy, communications, and transportation facilities vital to the economic health of California (Public Resources Code section 32301(h)). Levee maintenance and improvements in the Delta are critical for reducing risks to acceptable levels. Depending on the ownership of the levee, the responsibilities for these activities—and the financial investment required—are assigned to state agencies and/or local landowners and reclamation districts.

Although many major levees are Project levees and managed by state agencies, 65 percent of the levees in the Delta are non-Project local levees. These levees are not part of the federal flood-control program and are maintained by local agencies (primarily reclamation districts) that are partially reimbursed by the State. It is difficult for local agencies to raise funds for the local share of state and federal assistance programs. Also, few Delta properties have federal or private flood insurance, and as a result, these uninsured property owners may be solely responsible for repairs and losses following a levee failure.



Although the State has expended ~~tens-hundreds~~ of millions of dollars since ~~2000-1988~~ on Delta levee operation, maintenance, and improvement, significant funding would still be needed to raise all Delta levees to PL84-99 standards. Given the potential threats faced by Delta levees, risk must be reduced through a set of management policies that prioritize strategic and focused investments of resources into levees economically based risk reduction actions in a manner that best balances the multitude of uses in the Delta. The State Council, in consultation with the Central Valley Flood Protection Board, is required to promote effective strategic levee investments and recommend prioritization of State investments (Water Code section 85305(a), 85306).

## **Problem Statement**

There is no clear state policy for ~~flood management~~ long-term sustainable risk reduction and state funding within the Delta. Priorities need to be set for state-funded ~~flood management~~ sustainable risk reduction investments.

## **Policies**

RR P6 In consultation with the Central Valley Flood Protection Board, the Council shall develop a strategic risk reduction investment plan that will identify potential improvements with the greatest public benefits, is economically and ecologically sustainable, and contributes to the achievement of the co-equal goals. The strategic investment plan shall~~An action utilizing State investments for levee improvements in the Delta shall:~~

- φ Reduce risk of loss of life.
- φ Not result in an increase in the number of people at risk.
- φ Recognize the wide variability of conditions across the Delta, including: depth of inundation upon failure; current height and condition of existing levees; degree of exposure to seismicity, sea level rise, climate change, and river flood levels; the ability of land uses to recover from short or long-term inundation, and the consequences to water quality, critical utilities and transportation corridors.
- φ Evaluate investment in alternative ~~flood management~~ risk reduction strategies, comparing levee upgrade to flood-proofing, acquisition and conversion to habitat; subsidence reversal; relocation of infrastructure, and flood insurance.
- φ Evaluate long-term drivers of change and economic sustainability before establishing funding priorities
- φ Integrate risk reduction investments with the co-equal goals through the coordinated evolution of some islands to habitat.

## **Emergency Preparedness and Response**

Emergency preparedness is the first line of flood defense. It is imperative that federal, State, and local governments—the citizens themselves—be prepared for a variety of emergency situations. Emergency response should be routinely tested and practiced (Delta Vision Blue Ribbon Task Force 2008).

To effectively and reliably reduce risks to people, property, and state interests in the Delta, a multifaceted strategy of coordinated emergency preparedness, appropriate land use planning, and prioritized investment in ~~flood protection~~ risk reduction infrastructure is necessary and prudent. Delta levees not only protect life and personal property, but ~~also a few select levees~~ play a large role in protecting vital infrastructure, including the State's water conveyance system. Despite the risks of levee failure, no published emergency action plan exists that addresses the consequences to federal and State water supply

deliveries of catastrophic levee failure in the Delta. Although investment in flood-protection risk reduction measures and infrastructure can considerably reduce the likelihood of a-catastrophic losses levee failure, failures are inevitable and will require the implementation of well-coordinated and carefully developed emergency response planning efforts. To reduce response time while optimizing the effectiveness of the response effort, such plans will need to harness the unique capabilities of each agency with a mission in the Delta.

Despite the vital importance of adequate preparation, no updated Delta-wide emergency response plans currently under development need to be published-exists. The California Emergency Management Agency, Department of Water Resources, and several local agencies are preparing individual emergency response plans for the Delta, but the development of these should be coordinated, tested, and practiced. Strategies being prepared as directed by SB27 will address this issue, and will be considered in the Delta Plan.

### **Problem Statement**

Levee failures and flooding can and will place human life and property in danger, and On a long-term basis, certain specific levee breaches which are left open to the tides can also have potentially significant implications for the State's water supply and may help the health of the Delta ecosystem. Current land use activities which exacerbate land subsidence and increase the forces on levees further increase the probability and damages associated with levee failure.

### **Policies**

At this time, there are no policies with regulatory effect included in this section.

### **Recommendations**

RR R3 The following actions should be taken to promote emergency preparedness in the Delta:

- ϕ The Department of Water Resources and local flood management agencies should prepare and regularly update *Delta Multi-Hazard Coordination Plans and Inland Mass Evacuation Plans*; and participate in "Golden Guardian"-like emergency response exercises, Inland Mass Evacuation exercises, and emergency preparedness public training, notification, and outreach programs.
- ϕ The Department of Water Resources should complete their Delta Flood Emergency Preparedness, Response and Recovery Program addressing a wide range of emergency response strategies, being undertaken in coordination with the Corps of Engineers Delta Emergency Operations Plan, local emergency operations plans and water stakeholders. The Program would improve response and recovery time for impacts to life, property, critical infrastructure and environment in the Delta, and water supply interests reliant on the Delta.
- ϕ The Department should coordinate with state and federal agencies and water interests reliant on the Delta to implement an emergency freshwater pathway to export facilities considering unique needs and priorities in the event of a catastrophic multi-island failure.
- ϕ• In consultation with local agencies, the Department of Water Resources should expand their emergency stockpiles for repair of levee breaches and seismically-induced levee slumping in response to catastrophic levee failures, and to make them regional in nature and usable by a larger number of agencies. The Department, as a part of this plan, should evaluate the potential of creating stored material sites by "over reinforcing" western delta levees.

- φ State and local agencies and regulated utilities that own and/or operate infrastructure within the Delta should prepare emergency response plans to protect the infrastructure from longterm outages resulting from failures of the Delta levees. The emergency procedures should consider methods that also would protect Delta land use and ecosystem.
- φ Responsible Emergency Management Authorities should consider and implement the recommendations of the Delta Multi-Hazard Coordination Task Force (Water Code section 12994.5).

## Limitation of Liability

The U.S. Army Corps of Engineers and other federal agencies are afforded immunity from liability of any kind for damages arising from flood events through the provisions of the Flood Control Act of 1928. However, this immunity is not enjoyed by parties outside of the federal government.

The most notable recent court decision on flood liability was the November 2003 *Paterno vs. State of California* decision. The California Court of Appeals found the State liable, by inverse condemnation, for damages incurred by flooded residents as a result of failure of a Yuba River levee that the State did not design, build, or even directly maintain. This decision makes it possible that the State will ultimately be held responsible for the structural integrity of much of the federal flood-control system in the Central Valley—approximately 1,600 miles of State-Federal project levees that protect more than half a million people and property exceeding \$50 billion in value.

In another California court case, *Arreola vs. Monterey County*, local agencies were held liable in July 2002 for 1995 flood damages to property owners that resulted from a failure to properly maintain the Pajaro River project.

## Problem Statement

As the risks of levee failure and corresponding damage increase, California's courts have generally exposed public agencies, and the State specifically, to significant financial liability for flood damages (California Department of Water Resources 2005).

## Policies

At this time, there are no policies with regulatory effect included in this section.

## Recommendations

- RR R4 The Legislature should provide specific immunity for public safety flood protection activities, similar to that provided for police and correctional activities (Government Code section 844), and fire protection activities (Government Code section 850).
- RR R5 The Legislature should require an adequate level of flood insurance for individuals, businesses, and industries in floodprone areas.

## Financing of Local Flood Management Activities

No regional authority exists to facilitate the assessment and disbursement of funds for Delta [risk reduction measures](#), levee operations, maintenance, and improvements, or to collect and provide timely data and reporting on levee conditions. Such an authority could act to consolidate activities relating to [subsidence control](#), levee conditions assessment, data collection efforts, emergency preparedness notification, and fee authority. This could provide for a more [centralized-progressive](#) and responsive entity [managed-on-a-local-basis](#) for Delta interests [and long-term sustainability](#).

## Problem Statement

~~Financing~~ The economic justification to support the continued public funding of all local levee operations, maintenance, and ~~related data collection efforts is not well coordinated~~ improvements has not yet been conducted. Once economically based risk reduction priorities are established, a coordinated plan and effort to achieve a reduction in losses needs to be developed.

## Policies

At this time, there are no policies with regulatory effect included in this section.

## Recommendations

RR R6 A Delta Flood Management Assessment District should be created with fee assessment authority (including over state infrastructure) to provide adequate flood control protection economically based risk reduction measures and emergency response for the local and regional benefit of participants within the Delta.

This district should be authorized to:

- φ Develop, fund, and implement a regional plan of economically based risk reduction flood management for both Project and nonProject levees of the Delta in cooperation with the existing reclamation districts, cities, counties, and owners of infrastructure protected by the levees;
- φ Survey levees and report survey and conditions data to the Department of Water Resources at least every 5 years;
- φ Perform a beneficiary pay analysis for on-going anthropogenic changes which are increasing flood risk;
- φ In coordination with the Department of Water Resources and Corp of Engineers, establish standardized flood risk measurement data. This data should support the development of Expected Annual Damage values for the Delta. Expected Annual Damage is a measure of risk that integrates the likelihood and consequences of flooding, and is also the standard measure of the benefits of reducing flood risk; Expected Annual Damage estimates will include a comparative analyses of losses from on-going subsidence, water quality degradation and foregone ecosystem opportunities associated with maintaining the existing plan form versus a more economically sustainable form.
- φ Notify residents and landowners of flood risk on an annual basis;
- φ Develop emergency procedures including but not limited to evacuation.

Note that the Council is recommending in the Finance Plan (FP R4) that the proposed agency be given funding (up to \$110 ?? million) to develop and implement a strategic risk reduction investment plan that will identify potential improvements with the greatest public benefits, is economically and ecologically sustainable, and contributes to the achievement of the co-equal goals. the regional plan.

## Subsidence Reduction and Reversal

Much of the central Delta lands are composed of peaty soils that exist naturally as fibrous, low-density, compressible soils usually in a saturated state. To grow crops in such soils, farmers constructed levees and dikes around the tracts and drained the fields. Drying saturated peat reduces its volume by 50 percent. Early cultivation practices included burning, which further reduced the volume and altered the structure. Over time, long-term oxidation chemically reduced the peaty soils to small particles and gases that blew

away gradually. Today, much of the central Delta is below sea level, with some islands commonly 12 to 15 feet [and as much as 30 feet](#) below sea level, requiring levees that are 20 to 25-feet high [or higher](#) to hold back water every day. However, some recent practices that can reverse subsidence have been investigated. The State is participating in subsidence reversal pilot studies on Sherman and Twitchell islands and other areas.

### ***Problem Statement***

Agricultural practices have promoted deep subsidence over the last 150 years. Although subsidence has slowed or halted in many areas, some regions of the Delta [and Suisun Marsh](#) continue to subside [causing a significant increase in risks and damages to public interests. The costs associated with either historic or current subsidence have been born substantially by the general public and not by the local beneficiaries.](#)

### ***Policies***

At this time, there are no policies with regulatory effect included in this section.

### ***Recommendations***

RR R7 State agencies should not renew or enter into agricultural leases on western Delta islands that promote or contribute to subsidence on the leased land unless the lessee participates in subsidence-reversal or reduction programs.

φ [Perform a beneficiary pay analysis for on-going anthropogenic changes which are increasing economic and ecological risks;](#)

## **Reoperation of Upstream Reservoirs and Peak Flow Attenuation to Improve Flood Management**

The federal and State agencies have initiated evaluations to modify flood control management procedures on an individual stream basis but have not completed a comprehensive Delta watershed analysis. How reservoirs upstream of the Delta are operated can have substantial impacts on flood flows through the Delta; therefore, operations procedures among the responsible authorities should be well coordinated.

### ***Problem Statement***

Flood and water supply operations are not well coordinated between State and federal entities.

### ***Policies***

At this time, there are no policies with regulatory effect included in this section.

### ***Recommendations***

RR R8 U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and Department of Water Resources should modify flood control management procedures for reservoirs upstream of the Delta considering sea level rise, changes in precipitation, and changes in water supply operations.

## **Performance Measures**

φ Percentage of Delta levees that comply with the protection classifications shown in Table 7-1 based on land and resource uses.

- φ Percentage of residential and commercial structures covered by flood insurance in the Delta.
- φ Decrease in Delta area flood risk over time as measured by Expected Annual Damage.
- φ The development of written emergency preparedness and response plans and the frequency of emergency preparedness drills.
- φ Percentage of floodplains or floodways defined and regulated to protect flood capacity.

## References

- California Climate Action Team. 2010. State of California Sea-Level Rise Interim Guidance Document. Developed by the Sea-Level Rise Task Force of the Coastal and Ocean Working Group, with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. October.
- California Ocean Protection Council. 2011. Resolution of the California Ocean Protection Council on Sea- Level Rise. Adopted March 11.
- Delta Vision Blue Ribbon Task Force. 2008. Delta Vision Strategic Plan. Sacramento, CA. October.
- Department of Water Resources. 2005. "Flood Warnings: Responding to California's Flood Crisis." White Paper. [http://www.water.ca.gov/pubs/flood/flood\\_warnings\\_\\_\\_responding\\_to\\_california's\\_flood\\_crisis/011005floodwarnings.pdf](http://www.water.ca.gov/pubs/flood/flood_warnings___responding_to_california's_flood_crisis/011005floodwarnings.pdf).
- Department of Water Resources. 2009. Delta Risk Management Strategy Final Phase 1 Report. March.
- Department of Water Resources. 2010. North Delta Flood Control and Ecosystem Restoration Project Final Environmental Impact Report. Sacramento, CA. October.
- U.S. Army Corps of Engineers. 2002. Sacramento and San Joaquin River Basins California Comprehensive Study, Interim Report. Sacramento District.

AGENDA ITEM 7  
APPENDIX A  
THIRD STAFF DRAFT DELTA PLAN



**METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**  
**July 13, 2011**

**PROPOSED REDLINED REVISIONS TO  
FOURTH DRAFT OF DELTA PLAN**

**PAGE 5, Line 14-20 [BDCP/SWRCB flows]**

- The Delta Plan additionally calls for ~~prioritizing~~ the development and implementation of water flow ~~requirements objectives~~ for the Delta. ~~Until a~~ Updated flow ~~criteria~~ requirements will be ~~are~~ established and implemented by the SWRCB under its water quality and water rights authorities to protect the Delta ecosystem; ~~it is impossible to determine reliable levels of urban and agricultural water supplies available from the Delta. Separately, the BDCP is required to analyze various flow criteria and operational scenarios. The results of these processes are closely interrelated; SWRCB's determination of appropriate flow requirements will depend on the BDCP alternative eventually selected, and the ability of that alternative to meet the coequal goals will be influenced by SWRB adopted flows. Therefore, both the adoption of a BDCP alternative and of SWRCB flow requirements should be coordinated and expeditiously completed on a compatible timeline~~ Once flow objectives are set, conveyance alternatives should be considered that minimize reverse flows and reduce risk to water supplies posed by sea level rise and seismic threat. The Delta Plan also identifies water storage as a key element of adding flexibility and reliability to the Delta system.

**PAGE 48, LINE 12-22 [BDCP element consistency]**

## **Incorporation of the Bay Delta Conservation Plan into the Delta Plan**

The Bay Delta Conservation Plan (BDCP) is a major project considering large-scale improvements in water conveyance and large-scale ecosystem restorations in the Delta. When completed, it must be incorporated into the Delta Plan if it meets certain statutory requirements. If the BDCP is incorporated into the Delta Plan, it becomes part of the Delta Plan and therefore part of the basis for future consistency determinations.

After BDCP's incorporation, an agency proposing an ~~covered~~ action that is included in the BDCP or qualifies for credit under the BDCP may determine that it is a covered action and must file a consistency certification. That certification finding must find only that the covered action is consistent with the BDCP, not with other parts of the Delta Plan. The Council retains the authority upon appeal to find the covered action inconsistent with BDCP and therefore the Delta Plan.

**PAGE 62, PAGE 31—PAGE 64, PAGE 29 [Water management regulatory policies]**

### ***Policies***

The following policies (WR P1, WR P2, and WR P3) can apply as regulatory policies only for the purposes of the consistency review process and where the following conditions are met:

A. where a public agency that initiated the consistency review process approves, funds, or carries out a covered action; and if either B. or C. Where it does, that covered action is inconsistent with the Delta Plan if, and only if, one or both of the following applies:

B.A. The covered action involves the export of water from the Delta or involves the transfer of water through the Delta, and an appeal is filed alleging the need for that covered action is ~~significantly~~ caused by the



significant failure of ~~one or more water suppliers~~ the certifying entity to comply with policies WR P1, WR P2, and/or WR P3.

CB. The covered action involves the use of water in the Delta, and an appeal is filed alleging the need for that covered action is ~~significantly~~ caused by the significant failure of the certifying entity ~~one or more water suppliers~~ to comply with policies WR P1, WR P2, and WR P3.

If these conditions are met, the Council may consider an argument by the appealing party that the consistency determination's finding is incorrect because of a failure to meet these policies. Where, however, in all other situations neither A nor B applies, the following (WR P1, WR P2, and WR P3) are only recommendations.

WR P1 Water suppliers ~~should~~ shall demonstrate compliance with existing State laws promoting water supply planning, conservation, and efficiency measures:

φ Urban water suppliers

- Adopt and implement an Urban Water Management Plan and all required elements and measures, meeting the standards and timelines established in Water Code section 10610 3 et. seq.
- Adopt and implement a plan to achieve 20 percent reduction in urban per capita water use by December 31, 2020, meeting the standards and timelines established in Water Code section 10608 et. seq. 7

♦ Agricultural water suppliers

- Adopt and implement Agricultural Efficient Water Management Practices including measurement of the volume of water delivered to customers, adoption of a pricing structure based in part on the quantity delivered, and implementation of specific conservation measures that are locally cost effective and technically feasible, meeting the standards and timelines established in Water Code section 10900 et. seq.
- Adopt and implement an Agricultural Water Management Plan and all required elements, meeting the standards and timelines established in Water Code section 10900 15 et. seq.

WR P2 To promote accountability throughout the state in achieving the coequal goals, water suppliers ~~should~~ shall, no later than December 31, 2015, expand an existing or add a new Water Reliability Element in their Urban Water Management Plan and/or Agricultural Water Management Plan. Water suppliers may also meet this requirement by including a Water Reliability Element in an approved Integrated Regional Water Management Plan or other water plan that provides equivalent information.

The Water Reliability Element ~~should~~ shall detail how water suppliers are sustaining and improving regional self-reliance and reducing ~~reliance dependence~~ on the Delta in meeting future water supply needs through investments in local and regional programs and projects and ~~should~~ shall document the manner in which the element contributes to actual or projected net reduction in reliance on the Delta in meeting California's future water supply needsexports. At a minimum, the Water Reliability Element ~~should~~ shall include:

♦ **A plan for possible interruption of Delta water supply:** Identify how reliable water service will be provided for a minimum periods of 6 months, 18 months, and 36 months in the event that diversions or exports from, or use of water in, the Delta are interrupted during an average water year, dry water year, and following three dry water years.

φ **Implementation of planned investments in water conservation, water efficiency, and water supply development:** Identify specific programs and projects that will be implemented over a 20-year planning period and how they are consistent with the coequal goals and will contribute to improved regional self-reliance and reduced reliance on the Delta in meeting future water supply needs, including, but not limited to, the following strategies:

- Water conservation
- Water use efficiency
- Local groundwater and surface storage
- Conjunctive use programs
- Water transfers
- Water recycling
- Use of currently non-potable groundwater
- Storm water capture and recharge
- Saline water and brackish water desalination

♦ **Evaluation of regional water balance:** Provide an assessment of the long-term sustainability of the water supplies available to meet projected demands within the supplier's hydrologic region, as defined by the 2009 California Water Plan Update, over the 20-year planning period. If the region's demand exceeds available supplies, identify the steps being taken through the Integrated Regional Water Management Plan to bring the region into long-term balance. If the region's demand exceeds available supplies and it does not have an Integrated Regional Water Management Plan or the Plan does not address the steps being taken to bring the region into balance, then describe how the supplier's programs and projects are helping to bring the region into balance.

♦ **Conservation-oriented water rate structure:** Evaluate the degree to which the supplier's current rate structure sustainably encourages and supports water conservation.

WR P3 Water suppliers ~~should~~shall, by December 31, 2020, develop and implement a conservation-oriented rate structure, which may include consideration of a water-budget-based rate structure that sustainably encourages and supports more efficient water use without causing a shortfall in system revenues.

## **PAGE 66, LINE 8-14 [SWRCB flow requirements]**

### ***Problem Statement***

~~Until the SWRCB updates and adopts water quality objectives and flow requirements objectives for the Delta, and high priority tributaries in the Delta watershed necessary to achieve the coequal goals, every Proposed actions that potentially increases the amount of water diverted from or moved through the Delta will be affected by SWRCB's flow requirements is vulnerable to legal challenge over the question of whether sufficient flows are available to protect and restore the environment.~~ The completion and implementation of the Delta water flow requirements, in coordination and conjunction with the BDCP, objectives is urgently needed to improve reliability of the State's water supplies.

## **PAGE 88, LINE 7—PAGE 89, LINE 7 [SWRCB flow requirements]**

### ***Policies***

ER P1 Prior to the establishment of revised flow ~~requirements~~ criteria and water quality objectives identified in ER R1, the existing Bay-Delta Water Quality Control Plan objectives shall be used to determine consistency with the Delta Plan.

♦ By June 30, 2013, the Council will request an update from the State Water Resources Control Board on items ER R1 (a) and (b). If the Board indicates the dates in items (a) or 12 (b) cannot be met by the dates provided, the Council will consider and may amend the Delta Plan if necessary to achieve progress on the coequal goals ~~in place of the updated flow objectives~~. For example, the Council could:

1. In an appeal of a consistency certification, consider an argument by the appealing party Determine that a covered action that would increase the capacity of any water system to store, divert, move, or export water from or through the Delta would not be consistent with the Delta Plan because until the revised existing flow objectives are inadequateimplemented.
2. Recommend that the State Water Resources Control Board cease issuing water rights permits in the Delta and the Delta watershed (or, if the absence of flow criteria is specific to one or more of the major tributaries, then the recommendation could be focused on the impacted areas).

## *Recommendations*

ER R1 The State Water Resources Control Board should update the Bay-Delta Water Quality Control Plan objectives and ~~establish~~ flows as follows:

- ♦ By June 2, 2014, adopt and implement updated flow requirements and water quality objectives for the Delta that are necessary to achieve the coequal goals.
- ♦ By June 2, 2018, develop flow criteria for high priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.

### **PAGE 91, LINE 7-20 [protect restoration opportunities]**

## *Problem Statement*

Landscape attributes, particularly elevation and other environmental conditions, have changed dramatically in the Delta and the Suisun Marsh over the last 160 years. The resultant reduction in the extent, quality, and diversity of habitats supporting native species has led to declines in populations of native resident and migratory species.

## *Policies*

ER P2 Habitat ecosystem restoration actions shall be consistent with the habitat type locations shown on the elevation map in Figure 5-3, and accompanying text shown in Appendix D, based on the *Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone* (DFG et al. 2010), with minor alterations.

The Council may amend the Delta Plan to incorporate revised figures and text from the Ecosystem Restoration Program's Conservation Strategy as the strategy is revised.

ER P3 Actions other than habitat restoration, including new or amended local or regional land use plans, shall demonstrate that they have avoided or substantially minimized the adverse impacts to the opportunity for habitat restoration at the elevations shown in Figure 5-3.

ER P4 State and local agencies constructing new levees, or substantially rehabilitating or reconstructing existing levees in the Delta shall evaluate and, where feasible, incorporate alternatives (including use of setback levees) that would increase the extent of floodplain and riparian habitats and avoid or substantially minimize the adverse impacts to the opportunity for habitat restoration.

**PAGE 5, Line 14-20 [BDCP/SWRCB flows]**

- The Delta Plan additionally calls for the development and implementation of water flow requirements for the Delta. Updated flow requirements will be established and implemented by the SWRCB under its water quality and water rights authorities. Separately, the BDCP is required to analyze various flow criteria and operational scenarios. The results of these processes are closely interrelated; SWRCB's determination of appropriate flow requirements will depend on the BDCP alternative eventually selected, and the ability of that alternative to meet the coequal goals will be influenced by SWRB adopted flows. Therefore, both the adoption of a BDCP alternative and of SWRCB flow requirements should be coordinated and expeditiously completed on a compatible timeline. The Delta Plan also identifies water storage as a key element of adding flexibility and reliability to the Delta system.

**PAGE 48, LINE 12-22 [BDCP element consistency]**

## **Incorporation of the Bay Delta Conservation Plan into the Delta Plan**

The Bay Delta Conservation Plan (BDCP) is a major project considering large-scale improvements in water conveyance and large-scale ecosystem restorations in the Delta. When completed, it must be incorporated into the Delta Plan if it meets certain statutory requirements. If the BDCP is incorporated into the Delta Plan, it becomes part of the Delta Plan and therefore part of the basis for future consistency determinations.

After BDCP's incorporation, an agency proposing an action that is included in the BDCP or qualifies for credit under the BDCP may determine that it is a covered action and file a consistency certification. That certification will be required to find the covered action is consistent with the BDCP itself, not with the Delta Plan. The Council retains the authority upon appeal to find the covered action inconsistent with BDCP and therefore the Delta Plan.

**PAGE 62, PAGE 31—PAGE 64, PAGE 29 [Water management regulatory policies]**

### ***Policies***

The following policies (WR P1, WR P2, and WR P3) can apply as regulatory policies only for the purposes of the consistency process and where the following conditions are met:

- A. A public agency that initiated the consistency process approves, funds, or carries out a covered action, and if either B. or C. applies.
- B. The covered action involves the export of water from the Delta or involves the transfer of water through the Delta, and an appeal is filed alleging the need for that covered action is caused by the significant failure of the certifying entity to comply with policies WR P1, WR P2, and/or WR P3.
- C. The covered action involves the use of water in the Delta, and an appeal is filed alleging the need for that covered action is caused by the significant failure of the certifying entity to comply with policies WR P1, WR P2, and WR P3.

If these conditions are met, the Council may consider an argument by the appealing party that the consistency determination's finding is incorrect because of a failure to meet these policies. However, in all other situations, the following (WR P1, WR P2, and WR P3) are only recommendations.

WR P1 Water suppliers should demonstrate compliance with existing State laws promoting water supply planning, conservation, and efficiency measures:

φ Urban water suppliers

- Adopt and implement an Urban Water Management Plan and all required elements and measures, meeting the standards and timelines established in Water Code section 10610 3 et. seq.
- Adopt and implement a plan to achieve 20 percent reduction in urban per capita water use by December 31, 2020, meeting the standards and timelines established in Water Code section 10608 et. seq. 7

♦ Agricultural water suppliers

- Adopt and implement Agricultural Efficient Water Management Practices including measurement of the volume of water delivered to customers, adoption of a pricing structure based in part on the quantity delivered, and implementation of specific conservation measures that are locally cost effective and technically feasible, meeting the standards and timelines established in Water Code section 10900 et. seq.
- Adopt and implement an Agricultural Water Management Plan and all required elements, meeting the standards and timelines established in Water Code section 10900 15 et. seq.

WR P2 To promote accountability throughout the state in achieving the coequal goals, water suppliers should, no later than December 31, 2015, expand an existing or add a new Water Reliability Element in their Urban Water Management Plan and/or Agricultural Water Management Plan. Water suppliers may also meet this requirement by including a Water Reliability Element in an approved Integrated Regional Water Management Plan or other water plan that provides equivalent information.

The Water Reliability Element should detail how water suppliers are sustaining and improving regional self-reliance and reducing reliance on the Delta in meeting future water supply needs through investments in local and regional programs and projects and should document the manner in which the element contributes to projected reduction in reliance on the Delta in meeting California's future water supply needs. At a minimum, the Water Reliability Element should include:

♦ **A plan for possible interruption of Delta water supply:** Identify how reliable water service will be provided for a minimum periods of 6 months, 18 months, and 36 months in the event that diversions or exports from, or use of water in, the Delta are interrupted during an average water year, dry water year, and following three dry water years.

φ **Implementation of planned investments in water conservation, water efficiency, and 1 water supply development:** Identify specific programs and projects that will be implemented over a 20-year planning period and how they are consistent with the coequal goals and will contribute to improved regional self-reliance and reduced reliance on the Delta in meeting future water supply needs, including, but not limited to, the following strategies:

- Water conservation
- Water use efficiency
- Local groundwater and surface storage
- Conjunctive use programs
- Water transfers
- Water recycling
- Use of currently non-potable groundwater
- Storm water capture and recharge
- Saline water and brackish water desalination

♦ **Evaluation of regional water balance:** Provide an assessment of the long-term sustainability of the water supplies available to meet projected demands within the supplier's hydrologic region, as defined by the 2009 California Water Plan Update, over the 20-year planning period. If the region's demand exceeds available supplies, identify the steps being taken through the Integrated Regional Water Management Plan to bring the region into long-term balance. If the region's demand exceeds available supplies and it does not have an Integrated Regional Water Management Plan or the Plan does not address the steps being taken to bring the region into balance, then describe how the supplier's programs and projects are helping to bring the region into balance.

♦ **Conservation-oriented water rate structure:** Evaluate the degree to which the supplier's current rate structure sustainably encourages and supports water conservation.

WR P3 Water suppliers should, by December 31, 2020, develop and implement a conservation-oriented rate structure, which may include consideration of a water-budget-based rate structure that sustainably encourages and supports more efficient water use without causing a shortfall in system revenues.

### **PAGE 66, LINE 8-14 [SWRCB flow requirements]**

## ***Problem Statement***

SWRCB updates and adopts water quality objectives and flow requirements for the Delta. Proposed actions that potentially increase the amount of water diverted from or moved through the Delta will be affected by SWRCB's flow requirements. The completion and implementation of the Delta water flow requirements, in coordination and conjunction with the BDCP, is urgently needed to improve reliability of the State's water supplies.

### **PAGE 88, LINE 7—PAGE 89, LINE 7 [SWRCB flow requirements]**

## ***Policies***

ER P1 Prior to the establishment of revised flow requirements and water quality objectives identified in ER R1, the existing Bay-Delta Water Quality Control Plan objectives shall be used to determine consistency with the Delta Plan.

♦ By June 30, 2013, the Council will request an update from the State Water Resources Control Board on items ER R1 (a) and (b). If the Board indicates the dates in items (a) or 12 (b) cannot be met by the dates provided, the Council will consider and may amend the Delta Plan if necessary to achieve progress on the coequal goals. For example, the Council could:

1. In an appeal of a consistency certification, consider an argument by the appealing party that a covered action that would increase the capacity of any water system to store, divert, move, or export water from or through the Delta would not be consistent with the Delta Plan because existing flow objectives are inadequate.
2. Recommend that the State Water Resources Control Board cease issuing water rights permits in the Delta and the Delta watershed (or, if the absence of flow criteria is specific to one or more of the major tributaries, then the recommendation could be focused on the impacted areas).

## ***Recommendations***

ER R1 The State Water Resources Control Board should update the Bay-Delta Water Quality Control Plan objectives and flows as follows:

♦ By June 2, 2014, adopt and implement updated flow requirements and water quality objectives for the Delta that are necessary to achieve the coequal goals.

♦ By June 2, 2018, develop flow criteria for high priority tributaries in the Delta watershed that are necessary to achieve the coequal goals.

**PAGE 91, LINE 7-20 [protect restoration opportunities]**

***Problem Statement***

Landscape attributes, particularly elevation and other environmental conditions, have changed dramatically in the Delta and the Suisun Marsh over the last 160 years. The resultant reduction in the extent, quality, and diversity of habitats supporting native species has led to declines in populations of native resident and migratory species.

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The Council may amend the Delta Plan to incorporate revised figures and text from the Ecosystem Restoration Program's Conservation Strategy as the strategy is revised.

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**From:** Karen Clark

**Sent:** Thursday, July 28, 2011 9:08 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** Postponed PR/Legislation Conference Call

**Importance:** High

All,

Tom will not be able to participate at 7:30 a.m. tomorrow morning for the PR/Legislation conference call but would like to have it for anyone who can participate at noon (Pacific Standard Time). Please use the same number to call in: 800-████-████ pass code █████

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[\*kclark@westlandswater.org\*](mailto:kclark@westlandswater.org)



**From:** Gayle Holman  
**Sent:** Thursday, July 28, 2011 9:18 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Postponed PR/Legislation Conference Call

Thanks. Will do.

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

-----Original Message-----

**From:** Karen Clark [<mailto:kclark@westlandswater.org>]  
**Sent:** Thursday, July 28, 2011 9:08 AM  
**To:** Tony Coelho; Bill Kahl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
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~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Karen Clark  
**Sent:** Thursday, July 28, 2011 10:15 AM  
**To:** Jackson, Kokita V.  
**Subject:** RE: Contact Info for Craig Manson

Hello Kokita,

Craig's direct office number is 916.321.4225. His cell phone number is [REDACTED] and email is [cmanson@westlandswater.org](mailto:cmanson@westlandswater.org)  
All correspondence related to litigation should be mailed to his attention at Kronick, Moskovitz, Tiedemann & Girard, 400 Capitol Mall, 27th Floor, Sacramento, CA 95814. The mailing address you have listed below is for any other correspondence or invoices.

Craig's administrative assistant is Rose Schlueter. She can be reached at 916.321.4525 or by cell at [REDACTED] Typically, Mr. Manson and Rose are in the office on Mondays, Tuesdays and Thursdays from 10:00 a.m. until 6:00 p.m. You can also reach Rose by email at [rschlueter@westlandswater.org](mailto:rschlueter@westlandswater.org)

Let me know if you need any additional information.

Sincerely,

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Jackson, Kokita V. [mailto:KJackson@BHFS.com]  
**Sent:** Wednesday, July 27, 2011 9:18 AM  
**To:** kclark@westlandswater.org  
**Subject:** Contact Info for Craig Manson

Hi Karen,

I'm trying to get Craig Manson's contact information for David Bernhardt. Can you please provide me with Mr. Manson's office and direct phone and his e-mail address and confirm the additional info I have below?

a) Name	Craig Manson
b) Title	General Counsel
c) Company	Westlands Water District
d) Address	P.O. Box 6056 Fresno, CA 93703
e) Email	
f) Phone Number	559.224.1523

Thanks!

Kita

**KoKita V. Jackson**

Legal Administrative Assistant  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW Suite 510  
Washington, DC 20005-7353  
tel 202.652.2349  
fax 202.296.7009

To ensure compliance with requirements imposed by the IRS, we inform you that any federal tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

This transmission and any attachment is attorney privileged and confidential. Any dissemination or copying of this communication is prohibited. If you are not the intended recipient, please notify us immediately by replying and delete the message. Thank you.

**From:** Carmela McHenry  
**Sent:** Thursday, July 28, 2011 10:29 AM  
**To:** Karen Clark  
**Subject:** RE: Postponed PR/Legislation Conference Call

Hi Karen:

Ed said to let you know that he is not able to participate in tomorrow's call at 12 PM.

If you have any questions, please let me know.

Thanks and have a great day!

Best,

Carmela

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Thursday, July 28, 2011 9:08 AM

**To:** Tony Coelho; Bill Kahl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

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*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Thursday, July 28, 2011 10:32 AM  
**To:** Carmela McHenry  
**Subject:** RE: Postponed PR/Legislation Conference Call

Thanks, Carmela. No problem. Hope you are having a good day, also :)

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
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(Fax) 916-448-4923

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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jackson, Kokita V.  
**Sent:** Thursday, July 28, 2011 11:42 AM  
**To:** Karen Clark  
**Subject:** RE: Contact Info for Craig Manson

Thank you, Karen.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, July 28, 2011 1:15 PM  
**To:** Jackson, Kokita V.  
**Subject:** RE: Contact Info for Craig Manson

Hello Kokita,

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Sincerely,

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Westlands Water District  
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e) Email  
f) Phone Number

559.224.1523

Thanks!

Kita

**KoKita V. Jackson**

Legal Administrative Assistant  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW Suite 510  
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**From:** Karen Clark

**Sent:** Thursday, July 28, 2011 12:00 PM

**To:** Karen Clark; Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conference Call

Everyone,

Unfortunately something came up on Tom's calendar and we will not not have a call at all tomorrow. Unless Tom requests that I schedule this sooner, we'll have our next regularly scheduled conference call on Friday, August 12. \*\*\*Tom will be on vacation from August 4 through August 11\*\*\*\*

Sincerely,

~Karen

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*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Thursday, July 28, 2011 9:08 AM

**To:** 'Tony Coelho'; 'Bill Kahrl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'

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**Importance:** High

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~Karen

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*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Gayle Holman  
**Sent:** Thursday, July 28, 2011 12:01 PM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conference Call

Thanks Karen!

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

-----Original Message-----

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**Sent:** Thursday, July 28, 2011 12:00 PM  
**To:** Karen Clark; Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
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*(o) 559.241.6234*  
*(f) 559.241.6277*  
*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

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**From:** Karen Clark [mailto:[kclark@westlandswater.org](mailto:kclark@westlandswater.org)]  
**Sent:** Thursday, July 28, 2011 9:08 AM  
**To:** 'Tony Coelho'; 'Bill Kahrl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'  
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*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Thursday, July 28, 2011 12:02 PM  
**To:** Gayle Holman  
**Subject:** RE: PR/Legislation Conference Call

Yippeeee!

~Karen

*Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93703  
(o) 559.241.6234  
(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

-----Original Message-----

**From:** Gayle Holman [mailto:[gholman@westlandswater.org](mailto:gholman@westlandswater.org)]  
**Sent:** Thursday, July 28, 2011 12:01 PM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conference Call

Thanks Karen!

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

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**From:** Karen Clark [mailto:[kclark@westlandswater.org](mailto:kclark@westlandswater.org)]  
**Sent:** Thursday, July 28, 2011 12:00 PM  
**To:** Karen Clark; Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** PR/Legislation Conference Call

Everyone,

Unfortunately something came up on Tom's calendar and we will not not have a call at all tomorrow. Unless Tom requests that I schedule this sooner, we'll have our next regularly scheduled conference call on Friday, August 12. \*\*\*Tom will be on vacation from August 4 through August 11\*\*\*\*

Sincerely,

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Thursday, July 28, 2011 9:08 AM

**To:** 'Tony Coelho'; 'Bill Kahl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'

**Subject:** Postponed PR/Legislation Conference Call

**Importance:** High

All,

Tom will not be able to participate at 7:30 a.m. tomorrow morning for the PR/Legislation conference call but would like to have it for anyone who can participate at noon (Pacific Standard Time). Please use the same number to call in: 800-■■■■-■■■■ pass code ■■■■

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Tom Birmingham  
**Sent:** Saturday, July 30, 2011 7:56 PM  
**To:** 'Dave Puglia'; 'Tom Nassif'  
**CC:** 'Ed Manning'; joe.findaro@akerman.com; 'Bernhardt, David L.'; 'Don Peracchi'  
**Subject:** FW: Meeting Request - Sen. Feinstein

The following is the email I received from Senator Feinstein's office.

---

**From:** Davis, Bryer (Feinstein)  
**Sent:** Saturday, July 30, 2011 3:17 PM  
**To:** 'Tom Birmingham'; Watts, John (Feinstein); Peterson, James (Feinstein)  
**Cc:** joe.findaro@akerman.com  
**Subject:** RE: Meeting Request - Sen. Feinstein

Tom, Senator Feinstein's schedule is very much in the air next week due to the Senate's schedule. She is happy to meet with you but has suggested finding a time in September, when she's back in DC after the August recess. I will touch base with you next month to find a time.

**From:** Karen Clark

**Sent:** Thursday, August 4, 2011 12:09 PM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** No PR/Legislation Conference Call Tomorrow

Everyone,

Since Tom is on vacation, we will not have a PR/Legislation conference call tomorrow.

Have a good weekend!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Thursday, August 4, 2011 12:09 PM  
**To:** kclark@westlandswater.org  
**Subject:** RE: No PR/Legislation Conference Call Tomorrow

thx U 2

[V Card](#) | [Bio](#) | [akerman.com](#)



CONFIDENTIALITY NOTE: The information contained in this transmission may be privileged and confidential, and is intended only for the use of the individual or entity named above. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this transmission in error, please immediately reply to the sender that you have received this communication in error and then delete it. Thank you.

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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, August 04, 2011 3:09 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Findaro, Joe (OC-DC); Sheila Greene; Susan Ramos  
**Subject:** No PR/Legislation Conference Call Tomorrow

Everyone,

Since Tom is on vacation, we will not have a PR/Legislation conference call tomorrow.

Have a good weekend!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Carmela McHenry  
**Sent:** Thursday, August 4, 2011 12:12 PM  
**To:** Karen Clark  
**Subject:** RE: No PR/Legislation Conference Call Tomorrow

Have a great weekend, Karen! ☺

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, August 04, 2011 12:09 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** No PR/Legislation Conference Call Tomorrow

Everyone,

Since Tom is on vacation, we will not have a PR/Legislation conference call tomorrow.

Have a good weekend!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Thursday, August 4, 2011 12:15 PM  
**To:** Carmela McHenry  
**Subject:** RE: No PR/Legislation Conference Call Tomorrow

Thanks, C. You too!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
**Sent:** Thursday, August 04, 2011 12:12 PM  
**To:** Karen Clark  
**Subject:** RE: No PR/Legislation Conference Call Tomorrow

Have a great weekend, Karen! ☺

*Carmela McHenry*  
(Direct) 916-498-7711  
(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Thursday, August 04, 2011 12:09 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
**Subject:** No PR/Legislation Conference Call Tomorrow

Everyone,

Since Tom is on vacation, we will not have a PR/Legislation conference call tomorrow.

Have a good weekend!

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Valerie Connor

**Sent:** Thursday, August 25, 2011 3:38 PM

**To:** Byron Buck; 'Terry Erlewine'; 'Arakawa,Stephen N'; ara.azhderian@sldmwa.org; 'Jason Peltier'; 'Simonek,Laura J'; Laura King Moon; Fullerton,David K; Smith,Lynda A (lsmith@mwdh2o.com); Frances Brewster; Fryer Lloyd; 'Joan Maher'; Sheila Greene (sgreene@westlandswater.org); Brent Walthall

**Subject:** FW: Delta Lead Scientist Interview - documents for review & meeting logistics

**Attachments:** Goodwin\_LSApPLICANTPackage\_Aug2011.pdf; Draft\_DLS\_Interview Questions\_24Aug2011.docx

Attached is the resume for the Lead Scientist position, and the interview questions from when Cliff was hired. There is a small window of opportunity for providing input on interview questions. Please let me know if you have ideas.

Valerie Connor, PhD  
Science Program Manager  
State and Federal Contractors Water Agency  
1121 L St., Suite 806  
Sacramento, CA 95814  
office: (916) 476-5053  
cell: (530) [REDACTED]

VConnor@sfcwa.org

---

**From:** Shouse, Michelle@DeltaCouncil [mailto:michelle.shouse@deltacouncil.ca.gov]

**Sent:** Thursday, August 25, 2011 3:10 PM

**To:** Norgaard, Dick; 'Vincent H. Resh'; 'hlcase@usgs.gov'; Van Nieuwenhuysen, Erwin@usbr; Messer, Dean@WATER RESOURCES; Rea, Maria@NOAA; Jeff McClain; 'mike\_chotkowski@fws.gov'; dzezulak@dfg.ca.gov; 'Leo Winternitz'; Valerie Connor; Gartrell, Greg@ccwater.com; Zuckerman, Tom@talavera.us; Isenberg, Phil@DeltaCouncil; Grindstaff, Joe@DeltaCouncil; Hastings, Lauren@DeltaCouncil

**Cc:** McGee, Jill@DeltaCouncil

**Subject:** Delta Lead Scientist Interview - documents for review & meeting logistics

Hello,

Attached you will find a letter of interest and a CV from Dr. Peter Goodwin, who we will be interviewing next week. The interview will take place in **Conference Room A on the 2<sup>nd</sup> floor of Park Tower located at 980 9<sup>th</sup> Street in Sacramento.** The interview panel will meet on **Wednesday August 31<sup>st</sup> at 9am.**

Also attached are interview questions updated from our last recruitment. Please review the questions and provide your comments back to me by COB Monday August 29<sup>th</sup>. If there are topics not addressed that you would like to see added, please send those along as well.

Following the interview, Dr. Goodwin will be giving a lunch time seminar (noon to 1pm), in the Conference Center of Park Tower. Please plan to attend the seminar. Following the seminar, we will briefly re-convene the interview panel to prepare the panels' formal recommendation for the Delta Independent Science Board. Therefore, we ask for your continued participation until approximately 1:30pm Wednesday August 31<sup>st</sup>. My apologies for not altering you of this earlier.

Thank you,  
Michelle

~~~~~  
Michelle K. Shouse

Delta Science Program  
USGS Biologist

916-278-9560 office  
916-261-2958 mobile  
[mkshouse@deltacouncil.ca.gov](mailto:mkshouse@deltacouncil.ca.gov)  
[mkshouse@usgs.gov](mailto:mkshouse@usgs.gov)



University of Idaho  
322 East Front Street,  
Boise, Idaho  
83702  
Tel: [208] 364-6183  
Cell: [208] 850-1211  
Email: [pgoodwin@uidaho.edu](mailto:pgoodwin@uidaho.edu)

April 27, 2011

Michelle Shouse  
California Delta Science Program  
By e-mail: [mkshouse@deltacouncil.ca.gov](mailto:mkshouse@deltacouncil.ca.gov)

**Re: Search for Lead Scientist of the Delta Science Program**

Dear Ms. Shouse,

Further to your recent announcement, I would like to express interest in the position of the Lead Scientist. The spatial scale and consequences of Delta management actions are immense and arguably one of the most serious challenges facing California and the nation. The Delta Science Program has set standards nationally and internationally for developing strong independent science to support policy and management. The continuous refinement of this process through the creation of the Delta Stewardship Council, the development of the Science Program staff and the more active role of the reconstituted Independent Science Board establishes a basis for helping resolve some of the most intractable challenges in water resource management.

**Relevant Professional Experience in the San Francisco Bay Watershed**

I am a licensed Civil Engineer in California and also a Fellow of the American Society of Civil Engineers. My experience has been in interdisciplinary research and management of aquatic ecosystems. I started my professional career as a graduate student working with Dr. Hugo B. Fischer at the University of California Berkeley on the hydrodynamic and salinity modeling of the Bay-Delta system. Over the years I have maintained a connection with Delta issues, most recently serving on the CALFED Independent Science Board between 2005 and 2009. During my tenure as Technical Director of Philip Williams and Associates (1989-1996), we were involved in many modeling, design, interdisciplinary planning studies, and performance assessment of environmental restoration and flood management projects in the San Francisco Bay Watershed.

### Other Relevant Experience

I am the founding Director of the Center for Ecohydraulics Research (CER) at the University of Idaho, which was created on the principles of collaboration and community science. Interdisciplinary projects focus on aquatic ecosystem restoration, particularly on balancing the competing needs of the recovery of threatened and endangered species such as salmon, white sturgeon and bulltrout with water deliveries and power generation. We are particularly interested in developing systems approaches that utilize emerging technologies such as green LiDAR and integration of real-time fish tracking with hydrodynamic models.

I have been the State Program Director for the NSF Experimental Program to Stimulate Competitive Research (EPSCoR) since December 2009. This research program includes extensive K-12 and public outreach activities that support the State Science and Technology Plan and University strategic plans. The position requires interaction with the Governor's office, the State EPSCoR Committee, legislators, State Board of Education, University administrators and faculty. My primary objective has been to build a cohesive science and engineering community from all Idaho's Universities and agencies around a common research theme (Water Resources in a Changing Climate). Current NSF EPSCoR awards in this area exceed \$20m with additional complementary funding through other federal agencies.

I currently serve as Chair of the Louisiana Coastal Area (LCA) Science Board. The LCA program is developing a sustainable future for that region of the Gulf Coast and is also administered through the USGS. Other relevant activities include the External Science Committee for the Columbia River Estuary Juvenile Salmon Habitat Landscape Planning Framework and the International Scientific Steering Committee of the Center for Patagonian Ecosystem Research in Chile. As Vice President of IAHR ([www.iahr.org](http://www.iahr.org)), I have been an invited reviewer of several relevant international programs such as *Hydrosphere* by the University of Karlsruhe in Germany and the Singapore-Delft Water Alliance at the National University of Singapore. In this capacity I have been able to relay many of the lessons and successes of CALFED and have learned much from these other major programs.

This is a challenging position and I believe Dr. Dahm, the Independent Science Board, the Delta Stewardship Council and the achievements of the Science program staff have created the foundation to provide the best available science approaches to inform policy and management actions. I look forward to an opportunity to discuss the possible match of my background with your needs for the new Lead Scientist.

Sincerely,

A handwritten signature in blue ink that reads "P. Goodwin". The signature is stylized with a large, looped "P" and a cursive "Goodwin".

Peter Goodwin, PhD, PE  
DeVlieg Presidential Professor of Civil Engineering.

# **CURRICULUM VITAE**

## **University of Idaho**

**NAME:** Goodwin, Peter

**DATE:** February 20, 2011

**RANK OR TITLE:**

DeVlieg Presidential Professor of Civil Engineering  
Director, Center for Ecohydraulics Research, College of Engineering  
Director, Idaho EPSCoR/IDeA

**DEPARTMENT:** Civil Engineering

**OFFICE LOCATION:** College of Engineering - Boise  
University of Idaho  
Idaho Water Center,  
322 East Front Street, Suite 340  
Boise, ID 83702

**OFFICE PHONE:** (208) 364-6183

**EMAIL:** [pgoodwin@uidaho.edu](mailto:pgoodwin@uidaho.edu)

**WEB PAGES:** <http://ecohydraulics.uidaho.edu>

**DATE OF FIRST EMPLOYMENT AT UI:** August 15, 1996

**DATE OF PRESENT RANK OR TITLE:** July 1, 2002

**EDUCATION BEYOND HIGH SCHOOL:**

**Degrees:**

Ph.D., Hydraulic Engineering, 1986, University of California, Berkeley  
(Thesis undertaken in collaboration with the California Institute of Technology)  
Major Professor: H.B. Fischer (dec. 1983), R.J. Sobey (UC Berkeley) and N.H. Brooks (Caltech)  
M.S., Hydraulic and Coastal Engineering, 1982, University of California, Berkeley (GPA 4.0/4.0)  
B.Sc., Civil Engineering (First Class Honors), 1978, University of Southampton, United Kingdom

**Professional Background and Interests**

Peter Goodwin is the founder of the Center for Ecohydraulics Research at the University of Idaho, an interdisciplinary group which works on the simulation of ecological response due to management actions or changes in physical processes of rivers, lakes, estuaries and wetlands. His research interests are in modeling physical processes in natural and disturbed aquatic systems, and quantifying benefits of restoration activities.

Dr. Goodwin has participated in river restoration, flood control and sediment management projects in several different countries. Research in watershed management issues include: the Deadwood River, Coeur d'Alene River basin, the Upper Salmon River basin and the Lake Amatitlan watershed in Guatemala. He has undertaken several multi-objective river enhancement plans that address flood hazard reduction, ecological enhancement, water quality, habitat and recreational opportunities; examples include, Russian River, Napa River, Boise River, Red River, Salmon River, San Lorenzo River, and Feather River. During a 2003-04 sabbatical, he was part of the team that established the multi-national Patagonian Ecosystems Research Center (CIEP) in Chile.

He has participated in many estuarine and tidal wetland projects on the East and West Coasts of the US, including a study of salinity intrusion in San Francisco Bay with Professor Hugo Fischer and has been the project manager/principal investigator for several wetland enhancement studies; examples include the Venice Canals and San Dieguito Lagoon in California. He has undertaken numerous modeling studies of estuarine, coastal and tidal wetland systems, including Mugu Lagoon, San Elijo Lagoon, Russian River Estuary, Sonoma Baylands, San Pablo Bay, Napa Salt Ponds and Delaware Bay).

Dr. Goodwin has taught undergraduate, graduate and continuing education courses in fluid mechanics, hydraulic engineering, sediment transport, hydrology, aquatic ecosystem restoration and computational hydraulics. As Director of Idaho EPSCoR/IDeA he is also involved with building the research enterprise of Idaho, building the k-12 STEM pipeline and developing programs to ensure the face of the future US workforce reflects the face of America.

**EXPERIENCE:****Teaching and Research:**

January 2010-present, Director, Idaho EPSCoR Program  
 January 2005-present, Director, Center for Ecohydraulics Research  
 July 2002-present, Professor, Department of Civil Engineering, University of Idaho  
 July 2001-present, DeVlieg Presidential Professor of Ecohydraulics, University of Idaho  
 August 1996-2002, Associate Professor, Department of Civil Engineering, University of Idaho  
 March 1998-present, Adjunct Professor, Department of Biological and Agricultural Engineering, University of Idaho  
 1990, Visiting Instructor, Department of Civil Engineering, University of California, Berkeley  
 1989-96, External Research Adviser, Computational Hydraulics and Environmental Modeling Research Group, University of Bradford, United Kingdom  
 1987-89, Academic Staff Member, Computational Hydraulics and Environmental Modeling Research Group, University of Bradford, United Kingdom  
 1986-89, Lecturer in Water Engineering, Department of Civil Engineering, University of Bradford, United Kingdom

**Non-Academic Employment:**

1989-96, Technical Director and Principal, Philip Williams and Associates, Ltd.

**TEACHING ACCOMPLISHMENTS:****Courses Taught:**

## Undergraduate:

CE421/AgE451, Engineering Hydrology<sup>1,2</sup>  
 CE428/AgE458, Open Channel Flow<sup>1,2</sup>

## Graduate:

CE504, Physical Processes in River Management  
 CE524, Water Resources Planning<sup>1,2</sup>  
 CE528, Stochastic Hydrology<sup>1,2</sup>  
 CE529/AgE555, Natural Channel Flow<sup>1,2</sup>  
 CE521, Sedimentation Engineering<sup>1</sup>

## Other:

CE504, PE Review Course – Civil Engineering

<sup>1</sup> denotes class is delivered live and through compressed video (live multiple sites in Idaho)

<sup>2</sup> denotes class is delivered live and through video tape (web-assisted classes with students throughout the US and overseas)

## Short Courses - Course Organizer for:

An Introduction to Surface Water Modeling for Stream and Riparian Restoration Planning and Design. Society for Ecological Restoration. October 18-19, 2005. The Pines Conference Center, Bass Lake, California. A part of the 12<sup>th</sup> Annual SERCAL Conference, October 20-22, 2005.

Muddling through Modeling: Overview of Current state of the Science in River, Wetland and Estuarine Modeling. For California State Water Resources Control Board. February, 2005.  
 Geomorphology and Aquatic Habitat Modeling. University of Concepcion, Chile. March 22-27, 2004. [1.0cr]



## Short Courses - Course Organizer for (cont.):

- An Interagency Workshop to Investigate the Feasibility of a Biobio River Scientific Forum: *Keeping the river functioning and working*. March 29, 2004
- Muddling through Modeling: Overview of Current state of the Science in River, Wetland and Estuarine Modeling. For California Department of Fish and Game and the California Department of Water Resources. Sacramento. May 22-23, 2003.
- Emerging Computational Methods, Boise, November 12-13, 2002
- New Paradigms in River and Estuary Management, Boise. April 2-3, 2001
- River Modeling, Boise, October 23-25, 2000.
- New Paradigms in River Management. For US Army Corps of Engineers, Walla Walla, Washington, February 1999.
- Ecohydraulics - Quantitative Approaches to Watershed Processes, Boise, October 19, 1998.
- Tidal Wetland Restoration, ASCE Continuing Education Course, San Francisco, August 1997.
- Environmental River Management: Physical Processes in Ecological Restoration, Enhancement and Preservation, University of Idaho, Boise, May 1997.
- Mixing and Water Quality in Estuaries and Tidal Wetlands, for U.S. Navy, Environmental Division, Naval Air Station, Point Mugu, May 1995.
- Physical Processes in Estuarine and Coastal Wetland Management, University of California, Berkeley, June 9-13, 1992.

## Instructor in the following continuing education courses:

- Hydroacoustic Techniques for Measuring Flow and Sediment Transport in Large River Systems. With the USGS and the University of Concepcion for the Chilean DGA and graduate students. Coyhaique, Patagonia. January-February 2011.
- Impactos de la Hidroelectricidad sobre el ambiente físico. Concepcion, Chile. October 11-30, 2009.
- Minimizing environmental impacts of hydropower development: transferring lessons from past projects to a proposed strategy for Chile. January 19, 2009. Taller Científico: Desarrollo Hidroeléctrico en la Patagonia, Coyhaique, Chile.
- Integrated River Basin Management: the Role of Technology for the Biobio River, Chile. A Workshop for Industries operating in the Biobio Region. January 22, 2009.
- The Use of Technology in Watershed Planning and Management. October 11-12, 2006. Part of the "Watershed Stewardship" workshop for State and Federal Agencies, October 8-21, 2006. UC Riverside. Program supported by CALFED.
- Muddling through Modeling: Overview of Current state of the Science in River, Wetland and Estuarine Modeling. For California State Water Resources Control Board. Davis, California. December 2004.
- Integrated River Basin Management: Water Quality Assessment and Modeling. A UNESCO/ EU Graduate Program (3 credits). Centro EULA, University of Concepcion. January 2004
- Graduate Seminar in River Restoration, University of California, Berkeley. [Instructors included L.B. Leopold and A.L. Riley]. Fall 1998.
- Geomorphology in River and Stream Restoration, University of California, Berkeley, April 7-11, 1997; April 22-26, 1996; April 24-28, 1995.
- Physical Processes in Environmental River Management, University of California, Berkeley, October 20-22, 1993. Co-organizer.
- INSIGHT 88: A program to attract women into science and engineering, July 10-15, 1988.

**Students Advised:**

## External International Ph.D. Examiner:

- Wolfgang Kampke. (2010-present). Ichthyo-hydraulics. Karlsruhe Institute of Technology
- Maria Loinez. (2009-present). Source, transport and effects of fine sediment loading on Silver Creek, Idaho. Riskpoint research program. Danish Technical University.
- Hong Li. (2007-09) Spatial Pattern Dynamics In Aquatic Ecosystem Modelling  
Delft University of Technology, June 29 2009.
- Daniele Botelho (2004-06). Non-Hydrostatic Modelling of Stratified Flow in Lakes and Reservoirs. University of Western Australia, Perth.
- Bishnu Devkota (2003-2005). A New Approach to Modeling Large-scale River-Floodplain Systems. University of Western Australia.
- Lisa Jane Cluett (2003-04). Morphological responses to changes in discharge: the Lower Ord River, Western Australia. University of Western Australia.
- Anthony W. Minns (1998). Artificial Neural Networks in Hydrology. Technical University of Delft, The Netherlands

## Major Professor of funded UI Students (Outreach Graduate Students not included), completion date shown:

- Ph.D. Shawkat Ali, 2000-03, May 2003  
Charles Berenbrock, 2003-present  
Carter Borden, 2007-present  
Diego Caamano, 2004-08, Dec 2008  
Chris Campbell, 2007-present  
Steven R. Clayton, 1997-2002, May 2002  
Jack Harrison, 2000-05, May 2005  
Jasna Muskatirovic, 1999-2005, May 2005  
Sharon Parkinson, 2007-present  
Shaun Parkinson, 1998-2007, June 2007  
Andrew Tranmer, 2007-present  
David Tuthill, 1997-2002, Fall 2002
- M.S. Gloria Beattie, 1998-2002, May 2002  
Holly Bentz, 2007-present  
Ken Donley, 2000-01, December 2002  
Scott King, 1998-2002, May 2002  
Steve Lipscomb, 1998-2002, May 2002  
Heidi McRoberts, 1999-2002, May 2002  
Steve Sweet, 2008-present  
Matt Tiedeman, 2009-present  
Andrew Tranmer, 2004-07, June 2007  
Toni Turner, 2005-09, May 2009.

## Committee Member of UI Students ('Outside' Committee Member not included):

- Ph.D. Jeffrey Barry, [Major Professor: J. Buffington]  
Rohan Benjankar, [Major Professor: K. Jorde]  
Tai Bui [Major Professor: J. Milligan]  
Milos Manic [Major Professor: D. Wilamowski]  
Michele Reba [Major Professor: D. Marks]  
Daniele Tonina [Major Professor: J. Buffington]
- M.S. Christopher Campbell [Major Professor: J. Boll]  
Jeremy Newson [Major Professor: J. Boll]  
Sharon Parkinson [Major Professor: J. Boll/A. Minns]  
Stephen Robischon [Geography, Major Professor: Piotr Jankowski]  
Denis Ruttenburg [Major Professor: K. Jorde]

## External Committee Member (Outside the University of Idaho):

- Joe Wagenbrenner Ph.D. (2009-present). Post-fire sediment transport characteristics in headwater streams. Washington State University
- Jeffrey A. Lewandowski, Ph.D. (1989-93). Vegetation Resistance and Circulation Modeling in a Tidal Wetland. University of California, Berkeley.
- Nicholas E. Klat, Ph.D. (1991-94). Two Dimensional Numerical Modeling of Tidal Wetlands. University of California, Berkeley.
- Leslie Ferguson (2000-05). Quantifying the Effects of Stream Restoration on Fish Populations, University of California, Davis.

**SCHOLARSHIP ACCOMPLISHMENTS:** ( \* denotes student)**Books:**

- World Meteorological Organization/ Global Water Partnership, 2006. *Environmental Aspects of Integrated Flood Management*. The Associated Programme on Flood Management. A.C. Tyagi, M. Hyoda, A. Grobicki and WMO Expert Group. APFM Technical Document No. 3. Flood Management Policy Series. WMO, Geneva. 71p.
- Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana, 2006. Committee on the Restoration and Protection of Coastal Louisiana. National Academies of Sciences. 190pp.
- Falconer, R.A., and P. Goodwin (Eds.). 1994. *Wetland Management*. Thomas Telford, London. 289 pp.
- Falconer, R.A., P. Goodwin, and R.G.S. Matthew (Eds.). 1989. *Hydraulic and Environmental Modeling of Coastal, Estuarine and River Waters*. Gower Technical Press. 694 pp.

**Refereed Journal Publications:**

- Caamaño, D.\*, P. Goodwin and J. Buffington, 2010. Flow structure through pool-riffle sequences and a conceptual model for their sustainability in gravel-bed rivers. *River Res. Applic.* 26: 1–13
- Benjankar, R., N.F. Glenn, G. Egger, K. Jorde and P. Goodwin, 2010. Comparison of Field Observed and Simulated Map Output from a Dynamic Floodplain Vegetation Model Using Remote Sensing and GIS Techniques. *GIScience and Remote Sensing*. 47 (4). 480-497.
- Caamaño, D.\*, Goodwin, P., Buffington, J.M., Liou, J.C., Daley-Laursen, S., 2009. A unifying criterion for velocity reversal hypothesis in gravel-bed rivers. *Journal of Hydraulic Engineering*. ASCE. 135(1). 66-70.
- Barry, J.J.\*, J.M. Buffington, P. Goodwin, J.G. King, and W.W. Emmett, 2008, Performance of bed-load transport equations relative to geomorphic significance: predicting effective discharge and its transport rate, *Journal of Hydraulic Engineering*. ASCE. 134(5): 601-615,
- Tonina, D.\*, C.H. Luce, S.R. Clayton\*, S.M. Ali\*, J.J. Barry\*, B. Rieman, P. Goodwin, J.M. Buffington, C.E. Berenbrock\*, 2008.. Hydrological Response to Timber Harvest in Northern Idaho: Implications for Channel Scour and Persistence of Salmonids. *Hydrological Processes*, 22.
- Rumps, J.M.\*; S.L. Katz, K. Barnas, M.D. Morehead, R. Jenkinson\*, S.R. Clayton\*, P. Goodwin, 2007. Stream Restoration in the Pacific Northwest: Analysis of Interviews with Project Managers. *Journal of Ecology*
- Klein, L.R, S.R. Clayton\*, and P. Goodwin, 2007. Long-Term Monitoring and Evaluation of the Lower Red River Meadow Restoration Project, Idaho, USA. *Journal of Restoration Ecology*. 15(2). 223-239.

**Refereed Journal Publications (cont.):**

- Goodwin, P., K. Jorde, C. Meier and O. Parra, 2006. Minimizing environmental impacts of hydropower development: transferring lessons from past projects to a proposed strategy for Chile. *Journal of Hydroinformatics*. 8(3). 1-19.
- Bernhardt E.S., Palmer, M.A., J.D. Allan, G. Alexander\*, K. Barnas\*, S. Brooks\*, J. Carr, S. Clayton\*, C.N. Dahm, J. Follstad Shah\*, D.L. Galat, S.Gloss, P.Goodwin, D.D. Hart, B. Hassett\*, R. Jenkinson\*, S. Katz, G.M. Kondolf, P.S. Lake, R. Lave, J.L. Meyer, T.K. O'Donnell, L. Pagano, B. Powell and E. Sudduth\*, 2005. Synthesizing U.S. River Restoration Efforts. *Science*, **308**, April 29, 636-637.
- Goodwin, P., 2006. Closure. Analytical Solutions for Estimating Effective Discharge. *Journal of Hydraulic Engineering*. ASCE. 131(1).
- Palmer, M.A., E.S. Bernhardt, J.D. Allan, P.S. Lake, G. Alexander\*, S. Brooks\*, J. Carr, S. Clayton\*, C.N. Dahm, J. Follstad Shah\*, D.L. Galat, S.Gloss, P.Goodwin, D.D. Hart, B. Hassett\*, R. Jenkinson\*, G.M. Kondolf, R. Lave, J.L. Meyer, T.K. O'Donnell, L. Pagano and E. Sudduth\*, 2005. Standards for ecological successful river restoration. *Journal of Applied Ecology*, 42(2). 208-217.
- Goodwin, P., 2004. Analytical Solutions for Estimating Effective Discharge. *Journal of Hydraulic Engineering*. ASCE. 130(8). 729-738.
- Goodwin, P., 2001. New Paradigms in River and Estuary Management. Forum Article. *Journal of Hydraulic Engineering*. ASCE. 127(10), 792-793.
- Goodwin, P., A.J. Mehta and J.B. Zedler, 2001. Tidal Wetland Restoration. *Journal of Coastal Research*. SI27. 1-7.
- Goodwin, P. and R.Z. Kamman\*, 2001. Mixing and Circulation in Tidal Wetlands. *Journal of Coastal Research*. SI27. 109-120
- Slaughter, C.W., P. Goodwin and R. Marbury\*, 2000. Watershed Considerations for Integrated Stream Modeling. *International Journal of Sediment Research*, 15(1). 42-50.
- Goodwin, P. and T. B. Hardy, 1999. Integrated Simulation of Physical, Chemical and Ecological Processes for River Management. *Journal of Hydroinformatics* 1(1). IAWQ. August. 33-58.
- Josselyn, M.N., and P. Goodwin. 1999. Incorporation of Global Climate Change into Tidal Marsh Restoration Planning. *Journal of Current Topics in Wetland Biogeochemistry*, Vol. 3. 62-71.
- Goodwin, P. 1996. Predicting the Stability of Tidal Inlets for Wetland and Estuary Management. *Journal of Coastal Research*. SI 23, Winter, 83-101.
- Goodwin, P., and P.B. Williams. 1992. Restoration of Coastal Wetlands: The Californian Experience and Potential Applications in Europe. *Journal of the Institution of Water and Environmental Management*, 6, 709-719.
- Goodwin, P., and R.A. Denton. 1991. Seasonal Influences on the Sediment Transport Characteristics of the Sacramento River, California. *Proceedings of the Institution of Civil Engineers*, Part 2, 91, 163-172.
- Sobey, R.J., P. Goodwin, R.J. Thieke\*, and R.J. Westburg, Jr\*. 1987. Application of Stokes, Cnoidal and Fourier Wave Theories. *Journal of Waterways, Port, Coastal and Ocean Engineering*, ASCE, 113(6), 565-587.
- Lyn, D.A., and P. Goodwin. 1987. Stability of a General Preissmann Scheme. *Journal of Hydraulic Engineering*, ASCE, 113(1), 16-28.

**Refereed Publications:**

- Goodwin, P., C.M. Falter and A.D.K. Betts<sup>\*</sup>, 2000. Managing for Unforeseen Consequences of Large Dam Operation. Invited White Paper by the World Commission on Dams. Thematic Review Options Assessment IV.5: Operating, Monitoring and Decommissioning of Dams. 26p.
- Weinstein, M., P., K.R. Philipp and P. Goodwin. 2000. Catastrophes, Near-Catastrophes and the Bounds of Expectation: Success Criteria for Macroscale Marsh Restoration. In Weinstein, M. P. and D. A. Kreeger, eds., *Concepts and Controversies in Tidal Marsh Ecology*. Kluwer Academic Publishing: Dordrecht, The Netherlands, 237-259.
- Florsheim, J., P. Goodwin, and L. Marcus. 1998. Geomorphic Effects of Gravel Extraction in the Russian River, California. In *Aggregate Resources: A Global Perspective*. A.A. Balkema, Rotterdam, 88-99.
- Tuthill, D.<sup>\*</sup>, and P. Goodwin. 1998. Developing Decision Support for Implementation of Conjunctive Management in the Boise River Basin, Idaho. *Hydroinformatics 98*, A.A. Balkema/Rotterdam/Brookfield. 341-346
- Slaughter, C.W., and P. Goodwin. 1998. Hydrologic Modeling Approaches for Integrated Management of Stream Systems. *First Federal Interagency Hydrologic Modeling Conference*, April 1998. I, 119-125.
- Barnett, A.M., P. Goodwin, R.S. Grove, and F.L. Melone. 1994. Interdisciplinary Approach to Coastal Wetland Restoration. In *Hydroinformatics '94: Selected Papers of the First International Conference on Hydroinformatics*, Delft, September 22-24. A. Verwey, A. Minns, V. Babovic, and C. Maksimovic, Editors. A.A. Balkema, Rotterdam, 391-396.
- Goodwin, P. 1994. Physical Processes in Tidal Wetland Restoration. *Procs. of the First International Conference on Wetland Management*, June 2-4, Institution of Civil Engineers, London. 130-142.
- Goodwin, P., J. Lewandowski<sup>\*</sup>, and R.J. Sobey. 1992. Hydrodynamic Simulation of Small-Scale Tidal Wetlands. *Hydraulic and Environmental Modeling of Estuarine and River Waters*, Chapter 13, R.A. Falconer, K. Shiono, and R.G.S. Matthew, Eds., 149-161.
- Goodwin, P., R.G.S. Matthew, and N.G. Wright<sup>\*</sup>. 1989. Simulation of Flood Wave Propagation Due to Dam Failure Using the Preissman Scheme. *Proceedings of the International Conference on Hydraulic and Environmental Modeling of Coastal, Estuarine and River Waters*, Bradford, United Kingdom, 494-505.

**Conference Proceedings and Articles:**

- Parkinson, S., D. Caamaño, P. Goodwin and R. Benjankar, 2011. Field Evaluation of Pool Sustainability in Gravel Bed Rivers. 34<sup>th</sup> IAHR Biennial Congress. Balance and Uncertainty: Water in a Changing World. Brisbane, Australia, June 26-July 1, 2011.
- Sagar Neupane, Erika Ottenbreit, S.M. Helalur Rashid, Joseph Wagenbrenner, Peter Goodwin and David R. Tuthill, Jr.. 2011. Re-Building Consensus In The Henry's Fork Watershed: A Technical And Social Case Study Leading To A Path Forward For The Henry's Lake Outlet. 10<sup>th</sup> Annual River Restoration Northwest Symposium. Session 8. Skamania Lodge, Washington. Feb 1-3.
- Ruttenberg, D.A., K. Jorde, P. Goodwin, S. Clayton and P. Connolly, 2009. Hydraulic modeling and upstream fish passage effectiveness evaluation at rock vortex weirs based on field observations. 33<sup>rd</sup> IAHR World Congress, Water Engineering for a Sustainable Environment, Vancouver, British Columbia, Aug 9-14. TS15,C1.1-8.

**Conference Proceedings and Articles (cont.):**

- Caamano, D., M. McGowan and P. Goodwin, 2009. Green LiDAR and Two Dimensional Hydraulic Floodplain Modeling: An Optimal Tool for Flood Risk Outreach and Planning. 8<sup>th</sup> HIC-1A2-AM4. International Conference on Hydroinformatics. International Association for Hydraulic Engineering and Research. Concepción, Chile. January 12-16.
- Budwig, R., McLaughlin, R.E., Clayton, S., Sweet, S., and Goodwin, P., 2009. Physical modeling of wave generation for the Boise River Recreation Park in the Center for Ecohydraulics Stream Laboratory. Procs. of the International Conference of Science and Information Technologies for Sustainable Management of Aquatic Ecosystems, Concepción, Chile, January 12 -16, 2009.
- Tranmer, A.W. and P. Goodwin, 2009. Can General Circulation Models Detect Climate Change Signature in Catchment Scale Hydrology in the Intermountain West, USA? Procs. of the Proceedings of the International Conference of Science and Information Technologies for Sustainable Management of Aquatic Ecosystems, Concepción, Chile, January 12 -16, 2009.
- McCarty, K., M. Manic, P. Goodwin, M. Piasecki, 2009. Submission and Querying Tools for A Hydrologic Information Systems Database. HIC-1B1-DM4. 8<sup>th</sup> International Conference on Hydroinformatics. IAHR. Concepción, Chile. January 12-16, 2009
- Caamano, D. and P. Goodwin, 2007. On the Velocity Reversal Hypothesis. IAHR Biennial Congress. Venice, Italy. July 4-8.
- Caamano, D., P. Goodwin and M. Manic, 2006. Derivation of Bedload Transport Formula Using Artificial Neural Networks. 7<sup>th</sup> Int. Conf. on Hydroinformatics, Nice, France. IAHR.
- Barry, J.J., J.M. Buffington, J.G. King, and P. Goodwin, 2006, The Performance of bed load transport equations in mountain gravel-bed rivers: A re-analysis. Proceedings of the 8th Federal Interagency Sedimentation Conference, Reno, NV, April 2-6, 2006.
- Goodwin, P., 2005. Sediment transport in the sustainability of river form and process. NSF Pan-American Advanced Study Institute. Is sustainable hydropower development in an adaptive management framework achievable? Concepcion, Chile. January 7-30, 2005.
- Muskatirovic, J. and P. Goodwin, 2005. Prediction of bedload transport in gravel bed rivers with stable armor layer. XXXI IAHR Congress: Water Engineering for the Future – Choice and Challenges. Paper: PAHR05-0419. September 11-16, Seoul, Korea.
- Barry, J.J., J.M. Buffington and P. Goodwin, 2004. Performance of Bedload Transport Equations Relative to Geomorphic Significance. AGU Conference, San Francisco
- S.R. Clayton, J.K. Brostrom, I. Scherrer, P. Goodwin, and K. Jorde “Quantifying Physical and Biological Responses to Stream Restoration”, “Annual Meeting of Western Division of the American Fisheries Society”, February 2004, Salt Lake City, USA
- Goodwin, P., 2003. Restoration of aquatic ecosystems: detecting and quantifying change. Invited Paper at *Water: histories, cultures and ecologies* Conference. Perth, Australia.
- Muskatirovic, J. and P. Goodwin, 2003. On the prediction of Sediment Transport in Gravel Bed Rivers: Examples from Streams in Central Idaho. XXX IAHR Congress. C 663-670.
- Goodwin, P., S.J. Clayton\*, and J.K. Brostrom, 2002. Application of Adaptive Management to Stream Restoration at the Reach Scale. Invited Paper at the Symposium “*Adaptive Management in the Columbia Basin and Beyond.*” International Conference of the Transboundary Group and American Fisheries Society. Toward Ecosystem-Based Management: Breaking Down Barriers in the Columbia River Basin and Beyond. Spokane, Washington, April 27-May 1, 2002.

**Conference Proceedings and Articles (cont.):**

- S.J. Clayton\*, J.K. Brostrom and P. Goodwin, 2002. Evaluating Physical and Biological Responses to River Restoration. International Conference of the Transboundary Group and American Fisheries Society. Toward Ecosystem-Based Management: Breaking Down Barriers in the Columbia River Basin and Beyond. Spokane, Washington, April 27-May 1, 2002.
- Ali, S.\* and P. Goodwin, 2002. The Predictive Ability of 1-d Models to Simulate Floodplain Processes. Hydroinformatics 2002. Volume I: Model Development and Data Management. Cardiff, UK. July 2002. IAHR.247-52.
- Tuthill, D.R.\*, P. Goodwin and P. Jankowski, 2002. Utilization of Emerging Geo-spatial Technologies in Conjunctive Administration of Surface and Groundwater at the Catchment Scale. Hydroinformatics 2002. Volume II: Software Tools and Management Systems. Cardiff, UK. July 2002. IAHR.916-922.
- N.G. Wright, M.T. Dastorani\*, P. Goodwin and C.W. Slaughter, 2002. A Combination of Neural Networks and Hydrodynamics for River Flow Prediction. Hydroinformatics 2002. Volume II: Software Tools and Management Systems. Cardiff, UK. July 2002. IAHR.1627-34.
- Goodwin, P., 2000. A View of Hydroinformatics in the United States. Editorial in the *Journal of Hydroinformatics*, IAHR-IWA.1-3.
- Wright, N.G., P. Goodwin and S. Ali\*, 2001. The Importance of Appropriate Model Selection in Quantifying the Role of Floodplains in Flood Hazard Prediction. *Proceedings of the Symposium on Environmental Hydraulics*, December 2001, University of Arizona.
- Clayton, S.R\*, G.S. Beattie\* and P. Goodwin, 2001. Performance Evaluation of River Restoration. *21<sup>st</sup> Century: The New Era for Hydraulic Research and Its Application*. XXIX IAHR Congress of the International Association for Hydraulic Research. Beijing, China. September 17-21, 2001. Vol. D1, 101-107.
- Parkinson, S.K\*, J.A. Chandler and P. Goodwin, 2001. Simulation of White Sturgeon Response under Managed Flow Regimes. *21<sup>st</sup> Century: The New Era for Hydraulic Research and Its Application*. XXIX IAHR Congress of the International Association for Hydraulic Research. Beijing, China. September 17-21, 2001. Vol. D2. 697-705.
- Muskatirovic, J.\* and P. Goodwin, 2001. Aquatic Ecosystem Review in the Salmon River Basin. *21<sup>st</sup> Century: The New Era for Hydraulic Research and Its Application*. XXIX IAHR Congress of the International Association for Hydraulic Research. Beijing, China. September 17-21, 2001. Vol. B. 347-351.
- Tuthill, D.R.,\* and P. Goodwin, 2001. Utilization of Emerging Geo-Spatial Technologies in the Implementation of Conjunctive Management of Surface and Ground Water in the Boise River Basin. (Invited paper and presentation at the Environmental & Water Resources Institute Specialty *Symposium on Integrated Surface and Ground Water Management* held as part of the World Water and Environmental Resources Congress in Orlando, Florida, May 20-24, 2001).
- Ali, S.\*, C.W. Slaughter and P. Goodwin, 2001. Ecohydraulic model application in a steep rangeland. *Seventh Federal Interagency Sediment Transport Conference*. Session 6A. Reno, Nevada. Vol. I: Sediment and Flow Modeling, 168-175.
- Goodwin P., J. Muskatirovic\*, K. Overton and B. Rieman, 2000. Aquatic Systems Review. Invited opening keynote lecture, 4<sup>th</sup> International Conference on Hydroinformatics, *Hydroinformatics 2000*. Iowa Institute of Hydraulic Research, 23-27 July. International Association for Hydraulic Research. xxviii and 1-17.
- Beattie, G.S.\* , P. Goodwin, S.R. Clayton\*, S. Bauer and A.W. Minns, 2000. Performance Evaluation of River Restoration. In *New Trends in Water and Environmental Engineering for Safety and Life: Eco-compatible Solutions for the Aquatic Environment*. U. Maione, B.M. Lehto, R. Monti (eds.). A.A. Balkema, 18-29.

**Conference Proceedings and Articles (cont.):**

- Overton, C.K., P. Goodwin and J. Muskatirovic<sup>\*</sup>, 2000. A subbasin assessment approach for developing native salmonid conservation and restoration strategies. 12<sup>th</sup> International Trout Stream Habitat Improvement Conference “*Trout Stream Habitat in the New Millennium*.” Waterville, New Hampshire. Sept 11-13.
- Tuthill, Jr., D.R.<sup>\*</sup>, and P. Goodwin, 2000. Implementation of conjunctive management in the Boise River basin using a GIS-based decision support system. 4<sup>th</sup> International Conference on Hydroinformatics, *Hydroinformatics 2000*. Iowa Institute of Hydraulic Research, 23-27 July. International Association for Hydraulic Research.
- Parkinson, S.K.<sup>\*</sup>, Chandler, J.A. and P. Goodwin, 2000. An approach to simulating behavioral responses of juvenile white sturgeon to river management strategies. 4<sup>th</sup> International Conference on Hydroinformatics, *Hydroinformatics 2000*. Iowa Institute of Hydraulic Research, 23-27 July. International Association for Hydraulic Research.
- Slaughter, C.W., and P. Goodwin, 2000. Dynamic hydraulic modeling for a rangeland stream. Soils/Hydrology Technical Session, *Society for Range Management Conference 2000*, Boise, Idaho, February.
- Slaughter, C.W., G. Hyde, J.A. Scanlin, P. Goodwin and R. Beckwith, 2000. Partnerships incorporating students in watershed research, *Society for Range Management 2000*, Boise, Idaho, February.
- Slaughter, C.W., P. Goodwin, J.A. Scanlin, B. Beckwith and G. Hyde, 2000. The role of students in collaborative watershed research. 8<sup>th</sup> Biennial Watershed Management Council Conference, Pacific Grove, California.
- Slaughter, C.W., P. Goodwin, and R. Marbury<sup>\*</sup>, 1999. Watershed Considerations for Integrated Stream Modeling. Procs. *Sediment Management in Agricultural Watersheds. US-China Bilateral Conference*. Oxford, MS. December 6-9.
- Parkinson S.K.<sup>\*</sup>, J.A. Chandler and P. Goodwin 1999, Conceptual Decision Support for Preserving White Sturgeon Populations. 3<sup>rd</sup> International Conference on Ecohydraulics, IAHR. Salt Lake City, July.
- S.R. Clayton<sup>\*</sup>, P. Goodwin, G.B. Beattie<sup>\*</sup>, A.W. Minns, and S. Bauer, 1999. Monitoring Performance of River Restoration Projects. 3<sup>rd</sup> International Conference on Ecohydraulics, IAHR. Salt Lake City, July.
- Klein, L.R, D. Dawes, P. Goodwin, and S. Bauer. 1998. Lower Red River Meadow Restoration: A Case Study. Conference and Annual Meeting of the Society for Ecological Restoration. *Ecosystem Restoration: Turning the Tide*, October 28-30, Tacoma, Washington.
- Slaughter, C.W., P. Goodwin, and R.J. Marbury<sup>\*</sup>. 1998. Research Applications of Long-Term Catchment Information: Reynolds Creek Experimental Watershed, Idaho, US. Poster Presentation, *Hydroinformatics 98*, Copenhagen, Denmark.
- Neary, V., A. Mead, P.B. Williams, and P. Goodwin. 1998. Geomorphic Design for Large Scale River Restoration- the Napa River. Engineering Approaches to Ecosystem Restoration, D.F. Hayes, Ed.. Procs. of *ASCE Wetlands Engineering and River Restoration Conference*, Denver, March. ASCE.
- Goodwin, P., C.W. Slaughter, and R. Marbury<sup>\*</sup>. 1998. Dominant Discharge as a Design Criteria in River Restoration. Engineering Approaches to Ecosystem Restoration, D.F. Hayes, Ed.. Procs. of *ASCE Wetlands Engineering and River Restoration Conference*, Denver, March. ASCE.
- Goodwin, P., K. Philipp, and M.N. Josselyn. 1998. Hydrologic and Geomorphic Design for Large Scale Tidal Wetlands. Engineering Approaches to Ecosystem Restoration, D.F. Hayes, Ed.. Procs. of *ASCE Wetlands Engineering and River Restoration Conference*, Denver, March. ASCE.



**Conference Proceedings and Articles (cont.):**

- Slaughter, C.W., P. Goodwin, and L. Huber. 1998. Upland Watershed Considerations for Comprehensive River Restoration. Engineering Approaches to Ecosystem Restoration, D.F. Hayes, Ed.. Procs. of *ASCE Wetlands Engineering and River Restoration Conference*, Denver, March. ASCE. 96-101.
- Slaughter, C.W. and P. Goodwin, 1998. Hydrologic Modeling Approaches for Integrated Management of Stream Systems. Procs. *First Federal Interagency Hydrologic Modeling Conference*, Interagency Advisory Committee on Water Data, Vol. I. 119-125.
- Slaughter, C.W., and P. Goodwin. 1998. Application of Hydraulic Modeling Approaches to a Rangeland Watershed Stream. *51<sup>st</sup> Annual Meeting, Society for Range Management*, Guadalajara, February, 49-55.
- Neary, V.S., P.B. Williams and P. Goodwin, 1998. A Geomorphic Channel Design for Napa River. *Water Resources Engineering '98*. Procs. of Int. Water Resources Engineering Conference, Memphis, Tennessee, August 3-7. S.R. Abt, J. Young-Pezeshk and C.C. Watson eds., ASCE.
- Neary, V.S., A. Mead, P.B. Williams, and P. Goodwin. 1997. Hydraulic Geometry for River Estuaries. *Environmental and Coastal Hydraulics: Protecting the Aquatic Habitat*. Vol. 1. Procs. 27<sup>th</sup> Congress of the International Association for Hydraulic Research and the ASCE Conference: Water for a Changing Global Community, 683-688.
- Josselyn, M.N., and P. Goodwin. 1997. Incorporation of Global Climate Change into Tidal Marsh Restoration Planning. *Fifth Symposium on the Biogeochemistry of Wetlands*. University of London.
- Balletto, J.H., P. Goodwin, M.N. Josselyn, and K.J. Salamon. 1996. Macro-Scale Wetland Restoration: Meeting the Multiple Demands of Scientists, Regulators and the Public. *Wetlands for the Future*, Intecol International Wetland Conference, Perth, Western Australia, p. 112.
- Jordan, J.J., Y. Rubin, and P. Goodwin. 1995. Using Modeling to Establish Aggregate Mining Standards for Groundwater Protection. *Water Resources at Risk*, W.R. Hotchkiss, J.S. Downey, E.D. Gutentag, and J.E. Moore, American Institute of Hydrology, 97-107.
- Jordan, J.J., J. Florsheim, and P. Goodwin. 1995. Using Water Resource and Riparian Parameters to Develop a River Management Program. *Water Resources at Risk*, W.R. Hotchkiss, J.S. Downey, E.D. Gutentag, and J.E. Moore, American Institute of Hydrology, 88-96.
- Havno, K. and P. Goodwin, 1995. Hydraulic Modeling of Ecological Criteria: toward an integrated approach for hydrologic, geomorphic and ecologic understanding of river corridors. Seminar 2. *XXVII IAHR Congress*, London. 1-6.
- Goodwin, P. 1994. Circulation and Mass Transport in Tidal Wetlands. Invited Paper at the *Annual Conference of the Western Society of Naturalists*, Monterey, California, December 26-30.
- Liang, H.B., R.N. Coats, and P. Goodwin. 1994. The Limitations of Computer Modeling for Environmental River Management. *Procs. of the American Watershed Management Council Conference*, Ashland, Oregon.
- Cuffe, C.K., P. Goodwin, and J. Nielsen. 1993. Physical and Biological Effects of Inlet Closure and Breaching - Russian River Estuary, California. *Proceedings of the American Fisheries Meeting*.
- Goodwin, P., J. Nielsen, and C.K. Cuffe. 1993. The Tidal Inlet Characteristics of a Small California Estuary. *Hydraulic Engineering '93. Proceedings of ASCE National Conference on Hydraulic Engineering*, H.W. Shen, S.T. Su, and Feng Wen, Eds., Vol. 1, 562-567.
- Liang, H.B., C.K. Cuffe, P. Goodwin, and T. Abbe. 1993. Wave-Induced Erosion on a Tidal Marsh in Corte Madera Bay. *Coastal Zone '93. Proceedings of the 8<sup>th</sup> Symposium on Coastal and Ocean Management*, New Orleans, Louisiana.

**Conference Proceedings and Articles (cont.):**

- Lewandowski, J.A. \*, R.J. Sobey, and P. Goodwin. 1993. A Hydrodynamic Model for a Tidal Wetland. Hydraulic Engineering '93. *Proceedings of ASCE National Hydraulic Conference*, H.W. Shen, S.T. Su, and Feng Wen, Eds., Vol. 1, 574-579.
- Florsheim, J.L., P. Goodwin, and Y. Rubin. 1992. Historic Changes in Geomorphic and Hydrologic Processes in the Russian River, California. *EOS Transactions*, AGU 73(43):41.
- Florsheim, J.L., P. Goodwin, P.B. Williams, T. Abbe, and F.A. Booker. 1991. Analysis for Restoration of a Tidal Marsh, Slough Channel Evolution and Marsh Plain Sedimentation, San Francisco Bay, California. *GSA* 23(5):41, San Diego, California.
- Goodwin, P. 1991. Environmental Design of Flood Control Projects. Invited Paper at the *State Floodplain Management Association Annual Conference*, Sacramento, California.
- Goodwin, P., T. Abbe, and P.B. Williams. 1991. Marsh Erosion by Wave Action in Corte Madera Bay, California. Coastal Zone '91. *The Seventh Symposium on Coastal and Ocean Management*, Vol. 2, 1747-1761.
- Goodwin, P., and P.B. Williams. 1991. Short-Term Characteristics of Coastal Lagoon Entrances in California. Coastal Sediments '91. *Symposium on Quantitative Approaches to Coastal Sediment*, ASCE, Seattle, Washington, Vol. 1, 1192-1206.
- Goodwin, P. 1987. Aspects of Sediment Transport Modeling. Invited paper at the *International Symposium on Water Pollution Control and Water Treatment Techniques*, Tongji University, Shanghai, 12-21.
- Goodwin, P., and R.J. Sobey. 1986. Which Wave Theory? *Proceedings, IBM University AEP Conference*, San Diego.

**Professional Meeting Papers:****Selected Keynotes and Recent Invited Research Presentations:**

- 'Flow Structure and the Sustainability of Pools in Gravel Bed Rivers'. Gerhard Jirka Memorial Symposium. Karlsruhe. June 2011.
- 'Construyendo Comunidades Sustentables y con Resiliencia para Enfrentar Desastres: El Rol de las Universidades'. UN, World Bank, Chilean Ministry of Planning Workshop: *RECONSTRUCCIÓN REGIONAL DESAFIOS Y OPORTUNIDADES*. Concepción, Chile. April 13, 2010
- 'Trends in Interdisciplinary Environmental Research in the US'. Seminario Internacional. Los aportes de EULA a la Investigación y Formación de Recursos Humanos en Medio Ambiente en Chile. November 25, 2010. Concepción, Chile.
- 'River Restoration – A Global Perspective'. Keynote Lecture to the National Hydraulic Engineering Conference, Vina del Mar, Chile. October 21, 2009.
- 'Managing Rivers for Water Quality and Sequestration of Carbon and Mercury'. Opening Plenary talk to the European Union RISKPOINT Initiative. Copenhagen, Denmark. October 5, 2009.
- 'The California Bay-Delta System and CALFED Science Program'. In 'Lessons from other large-scale ecosystem management programs'. Louisiana Coastal Action Plan Science Board and General Walsh, Commanding Officer and Chair, Mississippi River Basin Commission. ERDC, Vicksburg, Mississippi. April 8, 2009.

**Selected Keynotes and Recent Invited Research Presentations (cont.):**

- ‘Avances en ingeniería eco-hidráulica en Norte América [New Trends on Hydro-Ecological Engineering in North America]: El papel de la comunidad de la ciencia [The Role of Community Science]’. CEDEX (Ministry of Public Works, Spain). Madrid. March 23, 2009.
- ‘Watershed Management for Water Quality’. Stormwater Technical Conference. Partners for Clean Water and EPA. Boise. March 3-4, 2009.
- ‘The Role of Community Science for Managing Large Delta Systems’. Also Facilitator and co-Author of Aquaterra Statement. ([www.aquaterraforum.com](http://www.aquaterraforum.com)) Prepared for the World Water Forum. A Whitepaper to declare Deltas and estuaries, regions of special concern. Aquaterra 10-12 February 2009.
- “Technology to Manage Rivers and Wetlands in a Hot, Flat and Crowded World”. Keynote Lecture at the Joint Conference, ‘Science and Information Technologies for Sustainable Management of Aquatic Ecosystems’. 7<sup>th</sup> International Symposium on Ecohydraulics and 8<sup>th</sup> International Conference on Hydroinformatics. International Association for Hydraulic Engineering and Research. Concepción, Chile. January 12-16, 2009.
- ‘Minimizing environmental impacts of hydropower development: transferring lessons from past projects to a proposed strategy for Chile’. January 19, 2009. Taller Científico: Desarrollo Hidroeléctrico en la Patagonia, Coyhaique, Chile.
- “Human, Physical, and Natural Capital Investment in Patagonia: a Predictive Approach under the Sustainability Criterion”. Institution of Civil Engineers. 2008 Americas Convention, ‘Sustainability’. October 4. Las Vegas.
- “Recent advances at the interface of Ecosystem Restoration and Cyberinfrastructure”. Keynote Lecture. Asian River Restoration Network. University of Tokyo. September 16, 2008
- “Approaches to Predicting the Performance of River and Wetland Restoration”. Keynote. 15<sup>th</sup> International Conference on Physical Processes in Natural Waters, Lake Tahoe, September 2-5, 2008.
- “Quantitative Performance Assessment of Stream Restoration”. Keynote. Montana River Restoration Conference, Missoula September 21-22, 2007
- “Building a globally competitive research program: the example of the Center for Ecohydraulics Research”, Idaho Business Council, Arid Club, Boise. June 13, 2007.
- “Building Environmental Observatories: The Example of the Idaho Experimental Watershed Network”. Keynote. Spring Runoff Conference, Utah State University, April 5-6, 2007.
- “Detecting and Predicting Change in Aquatic Ecosystems”. Arizona State University, Environmental Fluid Mechanics Seminar. March 7, 2007
- “Adaptive Management of Catchments”. Workshop for Self-learning Methodologies. Public Utilities Board, Singapore. January 24-26, 2007.
- “Challenges of Managing for a Sustainable Urban Environment”. Department of Civil Engineering, National University of Singapore. January 29, 2007.
- “Engineering Design for Climate Change and Coastal Communities”. Plenary Talk. National Conference on Coastal and Estuarine Habitat Restoration: Forging the National Imperative. [www.estuaries.org](http://www.estuaries.org). New Orleans, Louisiana. Dec 9-13, 2006.

**Selected Keynotes and Recent Invited Research Presentations (cont.):**

- “Challenges of Managing the Lower Mississippi River in Coastal Louisiana”. Session 4B. Idaho Water Resources Research Symposium, Boise, Idaho. November 28-29, 2006.
- “The River, Landscape and Community: Choices for the Future of the Boise River”. Boise Environmental Lecture Series. June 2006.
- “Trends in Community Science in the United States: the Example of Water Research. What small states are doing to remain competitive.” Presentation to the Federal Reserve Board, Idaho Water Center, September 6, 2006. Lecture delivered live from the IAHR International Conference on Hydroinformatics, Nice, France. Presentation included the benefits of the NSF EPSCoR program.
- “Emerging Technologies for Improving our Predictive Capabilities of River Response to Restoration”. Keynote Address. Fifth Annual Northwest Stream Restoration Design Symposium. January 31-Feb 2, 2006. Skamania Lodge, Stevenson, Washington.
- “Tendencias hacia Ciencias de la Comunidad: Observatorios Medioambientales y Redes Globales”. American Academy of Science and Technology, Santiago, Chile. January 6, 2006.
- “Approaches to Evaluating Impact of Dam Operation on Reservoir Productivity”. Payette Watershed Dam Operations Workshop: US Bureau of Reclamation, January 27, 2006
- “Opportunities and Expectations of Graduate Schools”. Invited presentation at the Fourteenth Regional Conference on Undergraduate Research of the Murdock College Science Research Program. Northwest Nazarene University. November 11, 2005.
- “Future Research Directions for IAHR: Cyberinfrastructure, Sensor Networks and Large Community Science”. Address to the Council of the International Association for Hydraulic Research. September 8-10, 2005. Seoul, Korea.
- “Creating a global student chapter network for graduate education and research support”. Address to the Student Chapters of the International Association for Hydraulic Research, XXXI IAHR Congress: Water Engineering for the Future – Choice and Challenges. September 11-16, 2005 Seoul, Korea.
- “Opportunities for Multi-National Collaboration in Chile: EULA and CIEP”. 57<sup>th</sup> Annual Conference of NAFSA, Seattle, Washington. Invited by the US-Chile Binational Commission. May, 2005
- “Sinergias Europa-América para la conservación de ecosistemas únicos: LA PATAGONIA CHILENA.” Cordoba, Spain. 20-22 April. Parra, O. and P. Goodwin, 2005
- “Las Exigencias Académicas en EE.UU”. Invited presentation to new 2004 Fulbright Scholars from Chile before their departure to the US. COMISION PARA EL INTERCAMBIO EDUCATIVO ENTRE CHILE Y LOS ESTADOS UNIDOS DE AMERICA. June 3, 2004.
- “Las bases científicas y los enfoques de manejo de las normativas de calidad del agua en USA”; Invited presentation at ‘Normativas de calidad del Agua: Bases científicas y enfoques de gestion’, Centro de Ciencias Ambientales EULA-Chile. January 8, 2004.
- “Sustainability of Tidal Wetlands”. ACE Seminar, Perth, Australia. September 2003.
- “Holistic Approaches to River Assessment and Management”; Pontificia Universidad Católica de Chile, Departamento de Ingeniería Hidráulica y Ambiental, Seminar on the Environment, November, 27, 2003.
- “Quantitative Approaches to Detecting Ecological Change due to Restoration”, Environmental Dynamics Seminar, University of Western Australia. September 18, 2003.

**Selected Keynotes and Recent Invited Research Presentations (cont.):**

- “Holistic Approaches to River Assessment and Management”; Pontificia Universidad Católica de Chile, Departamento de Ingeniería Hidráulica y Ambiental, Seminar on the Environment, November 27, 2003.
- “Emerging Technologies and Recent Advances in Analysis for Watershed Management”. Keynote Address. Ninth Biennial Conference, Watershed Management Council. Skamania Lodge, Washington. November 3-7, 2002.
- “Ecohydraulics”. Invited Speaker and participant at CLEANER (Collaborative Large-Scale Engineering Assessment Network for Environmental Research). Environmental Engineering Program, National Science Foundation, Duke University. October 20-22, 2002.
- “A Vision for the Boise River.” Idaho Environmental Forum, Boise. May 29, 2002.
- “Adaptive Management in River Restoration.” Inter-Agency Workshop on Modeling Tools for Watershed Restoration, Sacramento. May 23, 2002.
- “Changing Paradigms in River Management.” AASHTO Task Force on Hydrology and Hydraulics. Annual Meeting, Coeur d’Alene Resort. May 9, 2002.
- “Simulating Physical Processes at the Watershed Scale.” Environmental Sciences, Engineering and Policy in the 21<sup>st</sup> Century (ESEP-21) Seminar Series, University of Michigan. May 2001.
- “The Flood Control Controversy and Multi-Objective River Corridor Planning.” Idaho Environmental Forum, Boise. May 10, 2000.
- “Environmentally sensitive alternatives for the Truckee River.” Invited Presentation to the Community Coalition for the Truckee River Flood Management Plan, City of Reno, Nevada. May 20, 2000.
- “New Paradigms in Flood Management” Invited Presentation at Restoring the Arroyo, Pasadena, California, March 25, 2000.
- “Changing Paradigms in River Management and the Emergence of Ecohydraulics” Engineering Seminar Series, Boise State University, March 8, 2000.
- “Restoration of Large-Scale River Systems” Invited presentation and Chair, Panel 2: Living Waters: Our Natural Heritage. Eastern Idaho Watershed Conference, October 21-23, 1999.
- “Watershed Management - Is It Truly Achievable?” Presentation and Discussion Leader, ASCE Wetlands Engineering and River Restoration Conference, March 1998.
- “How Fast Should the Flow Rate Change?” Boise River 2000, Boise, February 1998.
- “The Flood Control Controversy: Traditional Approaches vs. Integrated Flood Management.” ASCE, San Francisco. March 27, 1997.

**Grants and Contracts Awarded:****Individual Research Contracts** (for further details refer to <http://ecohydraulics.uidaho.edu>):

Identifying Indicators and Guides for the Sustainability of Pools in Gravel Bed Streams: a laboratory and field verification. US Bureau of Reclamation Science and Technology Program. 2010-11.

A large-scale laboratory facility for alluvial and gravel-bed rivers. Congressional Authorization 2004-06, administered through FIPSE.

Simulation of the Effects of Floodplain Restoration along the Boise River. IDWR, City of Boise and FEMA. [2000-2001]. Reactivated by IDWR in 2009. 2009-12.

Fate and effects of the transport of mine tailings through the Coeur d'Alene river system. Idaho Department of Environmental Quality. (PI: P. Goodwin) [2001-2004].

Lower Red River Meadow Restoration Project. Idaho County Soil and Water Conservation District and Bonneville Power Administration. This project will design the restoration of a natural channel configuration and will monitor the geomorphic, hydrologic and ecologic evolution of the site following implementation. The site will also provide outdoor classroom opportunities for K-12 school children, undergraduates and a field laboratory for research [1998-2005]

National Science Foundation CAREER Grant: Ecohydraulics: Simulation of Physical Processes in River Ecosystem Management. The grant funds long-term monitoring of four watersheds, ranging from a pristine undisturbed watershed to a heavily urbanized catchment in San Francisco Bay. The grant integrates undergraduate education, research and disadvantaged high school children. [1999-2004].

Simulation of the Geomorphic and Ecologic Evolution of the 12 mile Reach, Salmon River. Idaho Department of Fish and Game and Bonneville Power Administration Fish and Wildlife Mitigation Program. [Phase I, 1999-2002]

Simulation of High and Low Temperature Extremes in the Upper Salmon River. Department of Fish and Game and Bonneville Power Administration Fish and Wildlife Mitigation Program. [2002-04]

Aquatic Systems Review: Quantifying the Benefits of Management Actions at the Watershed Scale. Bonneville Power Fish and Wildlife Mitigation Program, [1999-2001].

USGS/FEMA/IBDS: Studentship in Floodplain Research, [2000-01].

New Paradigms in River Management. A Workshop for the Walla Walla District, US Army Corps of Engineers, February 1999.

University of Idaho Seed Grant. Simulation of River Channels and Ecological response following Restoration: Example of the Red River. [1997-98].

State of Washington, Department of Ecology. Review of Wetland Function Assessment Project. [1997].

Salinity and Water Quality Modeling in the Tijuana Estuary. This study is funded by NOAA to investigate the effects of sewage spills on freshwater pulses released from the International Treatment Plant on the U.S.-Mexico border. Field measurements indicate an unusual mixing behavior within the estuary and adjacent pristine tidal wetlands in Oneonta Slough. [1995-98].

**Collaborative Research Grants:**

National Science Foundation: 2011 National NSF EPSCoR Conference, Coeur d'Alene, Idaho.

Deadwood River Project: Reservoir Operations Flexibility Investigation. US Bureau of Reclamation. 2009-2012: This project integrates current research at UI with real management applications. Real-time sensors will report through satellite to drive 3-d models of a river and reservoir system. This data is linked with real-time tracking of endangered bull trout to understand how reservoir operations affect the fish behavior. This project also includes collaboration with NASA to deploy their experimental green LiDAR technology for surveying topography, bathymetry and vegetation remotely.

Murdock Charitable Trust. *Instrumentation for the Idaho Stream laboratory*. [2007-09]  
PIs Ralph Budwig, P. Goodwin and K. Jorde.

National Science Foundation. *"Human, Physical, and Natural Capital Investment in Patagonia: a Predictive Approach under the Sustainability Criterion*. National Science Foundation. Pan American Advanced Study Institute. [2007-09]. PIs P. Goodwin, D. Nalle and S. Daley-Laursen.

EU and Danish Academy of Science. *"Riskpoint. Assessing the Risks posed by Point Source Contaminants to Groundwater and Surface Water Resources"*. [2009-11] Danish Technical University, Aarhus University and DMU-AY PI: M. Butts, co-PI. P. Goodwin.

USDA-FS Rocky Mountain Research Station. Multiple collaborative research projects (2007-2010).  
Example: *Alternative Fuel and Fire management* [2007-09]. PI C. Luce, co-PI P. Goodwin

Idaho's NSF Research Infrastructure Improvement Award (RII). *Idaho Experimental Watershed Network*. July 2005-2008. [J.M. Shreeve, ESPCoR State Director: Co-PIs G. Bohatch and P. Goodwin].

Lead Expert for a long-term research and science program related to a multi-state ecosystem litigation. For the Office of the Governor in a large East Coast State. Confidential Activity. August 2005-06.

A Synthetic Analysis of the Scientific Basis of Ecological restoration of Stream Ecosystems. National Center for Ecological Analysis and Synthesis/National Science Foundation. (PIs: Margaret A. Palmer, University of Maryland and J. David Allan, University of Michigan). [2002-06].

IMPACT: Software for Prioritizing Restoration Actions at the Watershed Scale. Bonneville Power Administration. 2001-02 (PI: P. Goodwin/V. Babovic, *DHI Water and Environment*).

Hydroinformatics: Computer and Infrastructure Support for the UI Ecohydraulics research Group in Boise. Congressional Authorization 2000-01, administered through FIPSE. (Technical PI: P. Goodwin/ Administrative PI: L. Stauffer). [FY01-04]

Modeling for Restoration of Watersheds in Central Guatemala following Hurricane Mitch, 2000-2004. US AID and USGS. (PI: L. Mink/ P. Goodwin).

Engineering and Physical Sciences Research Council, UK. Collaborative Research Travel Grant, 2001. (PI: N.G. Wright/Collaborator P. Goodwin)

Simulation of River Channel Evolution – Example of the Yankee Fork, 2000-02. US Forest Service. (PI: P. Goodwin/ J. Buffington)

Simulation of Total Dissolved Gas and Temperature in the Clearwater River System, Phase I, 2000. Idaho Department of Water Resources and the University of Idaho (PI: S.J. Wright/P. Goodwin)

**Collaborative Research Grants (cont.):**

Meadow Creek Natural Recovery Program, 1999-2000. Nez Perce Tribe and USFS. (PI: P. Goodwin/C.M. Falter)

Summary of Unanticipated Hydrologic and Ecologic Consequences of Large Dams, 2000. World Commission on Dams (PI: P. Goodwin/ C.M. Falter)

New Paradigms in the Management of River, Estuarine and Wetland Ecosystems. A NATO Advanced Research Workshop. (PI: Ambassador P. Tomka, United Nations/ P. Goodwin)

Lake Amrititlan Water Quality Assessment, Phase I, 1999. For the Office of the President, Guatemala. Idaho Water Resources Research Institute (PI: Dr. Roy Mink / P. Goodwin).

FEMA Project Impact: Lawyer Creek Flood Mitigation Plan, 1999. (PI: Dr. J. Milligan/ P. Goodwin and the CE521 class).

D2K: Data to Knowledge. A Danish Academy of Sciences TALENT Grant (PI: Dr. V. Babovic, Danish Hydraulic Institute). UI is an evaluation site and the grant funds exchange visits for UI research students to visit Denmark.

Simulation of Tidal Circulation and Water Quality in Southern California Wetlands, San Diego State University Foundation. Pacific Estuarine Research Laboratory and Philip Williams and Associates, Ltd. 1994-95.

Modeling of Flow and Solute Transport Processes in Coastal Embayments, NATO Research Award. University of Bradford, United Kingdom; Middle East Technical University, Turkey; University of Washington, USA; and Philip Williams and Associates, Ltd., USA. 1993-95.

EEC Collaborative Research Program. A grant awarded to the Research Group at Bradford, Tongji University and UNIRAS A/S (a leading computer graphics software company based in Denmark). The project studies sediment and pollutant transport in the coastal environment by field monitoring and computer simulation. [PI: R.A. Falconer] 1989-91.

Academic Link Agreement with the People's Republic of China. A research and exchange program funded by the British Council, initiated by Professor R.A. Falconer. Participating organizations are the University of Bradford, Tongji University (Shanghai), Peking University (Beijing), and the Institute of Power and Water Conservancy (Beijing). 1988-90.

Modeling Sediment and Pollutant Transport Processes Using Microcomputers. This IBM study grant was the first of its kind to be awarded in the United Kingdom. This grant allowed graphic visualization of complex flow fields for interdisciplinary research and undergraduate teaching. [1987-89]. [with Dr. R.A. Falconer]

Simulation of Floods Due to Dam Failure and Other Extreme Events. For the Department of the Environment (United Kingdom), \$60K, in collaboration with the U.S. National Weather Service. [1988-89]. [With Dr. Nigel Wright.]

Application of Higher Order Wave Theories. This work was supported by grants from Standard Oil of California (Chevron) and IBM and coordinated by Professor R.J. Sobey. 1985-86. This research was later combined into a software package and is available commercially under the name WAVEPRO.



**SERVICE:****Major Committee Assignments:**University of Idaho:

## University:

University Strategic Plan Update Steering Committee, 2010-present.  
 Federal Relations Working Group, 2009-present.  
 University Finance and Budgeting Committee, 2009-present.  
 Committee on Instituting Institutes. 2009-10.  
 University Request for Innovation (RFI) Assessment Committee (2008-09)  
 Strategic Planning: Team 2 Committee. 2007-2010.  
 President's Commission on Research Enhancement through Improving Information  
 Technology Infrastructure. June 2005-08.  
 University Promotions Committee, 2005-08.  
 Boise Futuring Committee, 1999-2001  
 Information Technology Committee, 2000-03; 2005-08

## University of Idaho - Boise Center

Academic Council, 2007-present  
 Chair, Search Committee for Associate VP/Center Executive Director 2006-07  
 Leadership Team and Strategic Planning Committee, 2004-08  
 Boise Center Dean Search Committee, 2000-01

## College of Engineering:

Research Council, 2009-present  
 Tenure and Promotion Committee, 2005-08  
 College of Engineering Executive Committee, 2004-present  
 Engineering Research Committee (Chair: Associate Dean Woodall), 1997-99  
 Editorial Committee, Engineering Advancement, 1998-present  
 Faculty Search Committee - Water Resources Position in Kimberley, 1998  
 Faculty Search Committee - NSF Distinguished Professor in Boise, 2000  
 Faculty Search Committee - Hydrology Position in Boise, 2000  
 Unit Strategic Planning Committee - Boise Center, 1998-99

## Department of Civil Engineering:

Tenure, Promotion & Competency Evaluation, 2004-08, Chair 2006-07.  
 Committee for Curriculum Review, 1996-98  
 Strategic Planning and ABET Assessment Committee, 1998-present  
 Graduate Admissions/Recruitment, 1998-2001  
 Ad Hoc Committee on Fluid Mechanics, 1998-2006  
 Alumni Involvement, 1997-2000

University of Bradford, United Kingdom 1986-89:

## University:

Computerization of Bradford University  
 Working Party on Hardware  
 Working Party on Software

## Civil Engineering Department

Computer Committee  
 Research Committee  
 Staff/Student Liaison Committee and Staff Representative on Student Telford Society

National/International Science and Engineering Committees:

- 2010-present, National EPSCoR Foundation Board Member.
- 2008-09. External Peer Review of the Mississippi Coastal Improvements Program (MsCIP) Comprehensive Plan. For Battelle and the US Army Corps of Engineers.
- 2007-present. Elected Vice-President, International Association for Hydraulic Research and Engineering, July 2007. Elected Council member 2003-07.
- 2007-present, Independent Science Review Committee, Singapore-Delft Water Alliance, National University of Singapore.
- 2007, External Review Panel, Sediment Transport Modeling Review. Grand Canyon Monitoring and Research Center. February 15-16, 2007. USGS Pacific Science Center, Santa Cruz.
- 2006-present. Science Board, Louisiana Coastal Area Plan (rebuilding the ecosystem and wetlands of coastal Louisiana post- Hurricane Katrina). *Chair from 2009.*  
<http://el.erdc.usace.army.mil/lcast/>, <http://lacoast.gov/> & <http://www.louisianacoastalplanning.org/>
- 2006-present. Member of Board, Boise Watershed Education Center, City of Boise.
- 2006-2008. NSF Advisory Committee on the WATERS Network Testbed Initiative (a merger of the CUASHI and CLEANER Environmental Observatories).
- 2006. NSF Workshop. EPSCoR 2020: Expanding State Participation in Research in the 21<sup>st</sup> Century – A New Vision for the Experimental Program to Stimulate Competitive Research (EPSCoR). PI: Jerome D. Odom. NSF Award# 0630747.
- 2005-09, Independent Science Board, CALFED program, California
- 2005-06, Committee on Environmental Aspects of Integrated Flood Management, World Meteorological Organization, WMO/GWP Associated Programme on Flood Management. Geneva, Switzerland.
- 2005-present. Science Advisory Panel. Tahoe Environmental Research Center, University of California.
- 2004-present. Member of the Review College for the Engineering and Physical Sciences Research Council, UK.
- 2004-present. Science Steering Committee, Multi-national Center for Patagonia Ecosystems Research (CIEP), Chile.
- 2005-07. NSF Committee to develop the Science Plan for the Collaborative Large-Scale Engineering Analysis Network for Environmental Research (CLEANER)
- 2004. Participant in NSF Project Science, Aspen Institute of Physics, October.
- 2004. Participant in NSF Sensors for Environmental Observatories, University of Washington, December.
- 2002-2006, National Academy of Sciences, Restoration and Protection of Coastal Louisiana Committee
- 1998-present. Stake-holders Advisory Committee. The Northwest Watershed Research Center, USDA Agricultural Research Service.
- 1996-, International Association for Hydraulic Research, U.S. Representative: Section Committee on Ecohydraulics
- 1996-2001, American Society of Civil Engineers, Chair, Task Committee on Tidal Wetland Restoration
- 1995-98, Chartered Institution of Water and Environmental Management, Overseas Correspondent
- 1994-96, Advisory Committee on Coastal Inlet Research Program, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg
- 1994, Invited Contributor to NATO Advanced Research Workshop on Hydroinformatics, Castle Vanenburg, the Netherlands
- 1993-2001, International Association for Hydraulic Research, U.S. Representative, Committee on Hydroinformatics (formerly Computational Hydraulics)
- 1991-94, American Society of Civil Engineers, Tidal Hydraulics Technical Committee (Chair, 1992-93)
- 1989-92, External Advisor to the Computational Hydraulics and Environmental Modeling Research Group, University of Bradford, United Kingdom
- 1987-90, Elected Member, Pennine Hydrological Group, Institution of Civil Engineers
- 1987-89, Working Party on Flood Channels, Science and Engineering Research Council, UK.

**Professional and Scholarly Organizations:**

## Membership in Engineering Professional Societies

Fellow, American Society of Civil Engineers  
 Fellow, Institution of Civil Engineers (United Kingdom)  
 Member, American Society of Engineering Education

## Membership in other Professional and Learned Societies:

American Geophysical Union  
 Association of Environmental Engineering and Science Professors  
 Fulbright Association  
 International Association for Hydraulic Engineering and Research (IAHR)  
 (from 2009: International Association for Hydro-environment Engineering and Research)  
 Engineering Council (United Kingdom)  
 University of California (Berkeley) Alumni Association  
 California Institute of Technology Alumni Association

**Professional Registration:**

Civil Engineer, California (C047323), Idaho (8365)  
 Chartered Engineer, United Kingdom (436222-58).  
 European Ingenieur, Europe (UK/ICE/1299)

**Recent Outreach Activities:**

Reviewer for the USGS on the Interagency Controlled Flood Experiments on the Colorado River.  
 2009-present.

Workshop to develop 'The Path Forward for Hydroinformatics'. Workshop to set the process for defining the field, developing the future research agenda and clarifying the relationships between different professional organizations and academic programs. Tianjin, China.  
 September 10-12, 2010.

Workshop on Research Management in the Eco-Environment, Establishing Global Eco-Environment Research Priorities for 2010-20. Invited Moderator and author, The Grand Challenges for the Future of Ecohydraulics Workshop. 8<sup>th</sup> International Symposium on Ecohydraulics. Sept 12-16, 2010. IAHR – Seoul, Korea.

Development of Joint Science Hypotheses and Region-wide Collaborative Proposals [April 8, 2010].  
 2<sup>nd</sup> Annual Tri-State Western Consortium Meeting, *Collaborative and Interdisciplinary Climate Change Science, April 6-8, 2010*. Lake Tahoe.

Review of Research Program and Strategic Plan of the Institute for Environmental Fluid Mechanics, Karlsruhe Institute of Technology, Germany. June 2009.

Integrated Floodplain Management Partners Workshop. World Meteorological Organization, Geneva.  
 November 13-14, 2008.

Research and Education in a Global Environment Workshop, January 8-9, 2008.  
 Moderator/Coordinator of the Implementation Action Plan for 2008. Chile.

Osher Institute of Lifelong Learning, Boise State University. Our Changing Boise River Landscape and its Implication on our Community. October 2, 9, 16 and 23, 2007

Boise Exchange Club. Coastal Flooding in Coastal Louisiana: Lessons for Boise! October 5, 2007

Idaho Business Council. Building a globally competitive research program: the example of the Center for Ecohydraulics Research, Idaho Business Council, Arid Club, Boise. June 13, 2007

Boise School District. Mathematics and Science Academy. Landscapes, Sediments and Mathematics – the example of Coastal Louisiana. April 2-3, 2007.

Student Chapter Council Liaison, International Association for Hydraulic Research. Responsible for developing the concept of international educational network between student chapters. Plan presented and approved by IAHR Council, September 2005.

**Recent Outreach Activities (cont.):**

Boise River Watershed Educational Center. Board Member of Boise Watershed Exhibits, a non-profit organization dedicate funds for educational exhibits for the new educational center as well as educational activities related to the Boise River and Watershed. 2005-present.

Search Committee for Lead Scientist, Science Program, CALFED June 2005-October 2005, June 2007-January 2008

Member, The College of the Engineering and Physical Sciences Research Council, United Kingdom, 2002-present.

Lecturer and participant in the NSF “*Scientists and Engineers in the Schools*” Program to celebrate the 50<sup>th</sup> Anniversary of the National Science Foundation, 2000-01.

Invited Reviewer, Draft Strategic Framework, Rocky Mountain Research Station. November 9<sup>th</sup>, 2001.

Co-Chair of the Flood Mitigation Task Committee for the Treasure Valley, at invitation of Brent Coles, Mayor of Boise, 1999-present.

Interagency Work Group on Temperature and Total Dissolved Gas, at invitation of Idaho Department of Water Resources, 1999-2003.

Scientific Review Panel for the San Dieguito Lagoon, California Coastal Commission, 1999-2003.

Associate Editor for the *Journal of Hydraulic Engineering*, American Society of Civil Engineers. Responsible for computational hydraulics with special emphasis on river and wetland restoration and management, 1997-2001.

Editorial Committee for the *Journal for Hydraulic Research*, International Association for Hydraulic Research, 1998-2002.

Editor, *Journal of Hydroinformatics*. 1999-2003. This new Journal (launched in January 1999) is published jointly by the International Water Association and the International Association for Hydraulic Research. Responsibility for computational hydraulics, environmental modeling and restoration.

Liaison Working Group, Northwest Watershed Research Center, USDA Agricultural Research Service. 1998-2002.

NOAA National Estuarine Research Reserve Program. Technical Review Committee. South Slough, Oregon. 1997-2005.

Scientific Review Panel, US Army Corps of Engineers, Tidal Inlet Research Program, 1995-97.

Lead Examiner: For Chartered Institution of Water and Environmental Management, London. Examiner and US Correspondent for the international C. Engr. registration (equivalent to PE in US), 1996-98.

**Recent Reviews for Grants include:**

National Science Foundation  
 M.J. Murdock Charitable Trust  
 National Wildlife Federation  
 USGS Water Resources Research Regional Competitive Grants Program  
 American Chemical Society  
 Board of Regents Support Fund, State of Louisiana  
 California Sea Grant Program  
 Oregon Sea Grant Program

**Recent Reviews for Journals include:**

*Journal of Hydraulic Engineering*  
*Journal for Hydraulic Research*  
*Journal of River Basin Management*  
*Canadian Journal of Civil Engineering*  
*Earth Surface Processes and Landforms*  
*Water Resources Research*  
*Environmental Engineering Science*  
*Proceedings of the Institution of Civil Engineers*  
*American Shore and Beach*

Selected Recent Reviews of Texts include:

- Long-term Benefits and Performance of Dams*, Ed. Henry Hewlett. British Dam Society, 676p.  
Review for the Institution of Civil Engineers.
- Restoring Streams in Cities: A Guide for Planners, Policymakers and Citizens*, by A.L. Riley,  
Island Press, p. 340.
- Tides, Bores and Mean Sea Level*, by N.T. Pugh. John Wiley Publishers. For *Times Literary Supplement* (London).

#### **Conference Organizing Committees:**

- 2009-11, International Scientific Editorial Board. 34<sup>th</sup> IAHR World Congress. Balance and Uncertainty: Water in a Changing World. Brisbane, Australia. June 26-July 1. 2011.
- 2008-10, Scientific Advisory Committee, 9<sup>th</sup> International Conference on Hydroinformatics, International Association for Hydraulic Research, Tianjin, China. Sept 7-11, 2010.
- 2008-10, International Scientific Advisory Committee, 9<sup>th</sup> International Symposium on Ecohydraulics, International Association for Hydraulic Research, Seoul, Korea, Sept 12-16, 2010.
- 2007-09. International Advisory Committee for Aquaterra 2009, the Netherlands.
- 2006-09, International Scientific Advisory Committee, Joint International Conference on Hydroinformatics and Ecohydraulics Symposium, International Association for Hydraulic Research, Concepcion, Chile, 2009.
- 2006-09, International Scientific Advisory Committee, Joint International Conference on Hydroinformatics and Ecohydraulics Symposium, International Association for Hydraulic Research, Concepcion, Chile, 2009.
- 2004-06, International Scientific Advisory Committee, 7<sup>th</sup> International Conference on Hydroinformatics, HIC 2006. Joint Conference of International Association for Hydraulic Research, and International Association for Hydrological Sciences. 4<sup>th</sup>-8<sup>th</sup> Sept, 2006, Nice, France.
- 2003-2005, XXXI Congress of the International Association for Hydraulic Research, September 2005, Seoul, Korea.
- 2000-02, Hydroinformatics 2002, 5<sup>th</sup> International Conference on Hydroinformatics, University of Cardiff, July 2002.
- 2000-2001 First International Conference on River Basin Management, Wessex Institute of Technology, UK, September 2001.
- 1999-2001, NATO Advanced Research Workshop, "New Paradigms in River and Estuarine Management", Sun Valley, Idaho, April 2001.
- 1998-2000, Hydroinformatics 2000, 4<sup>th</sup> International Conference on Hydroinformatics, Iowa City, Iowa Institute for Hydraulic Research. July 18-21, 2000.
- 1997-98, Watershed Management Council 7<sup>th</sup> Biennial Conference: Western Watersheds: Science, Sense and Strategies, Boise, Idaho, October 19-23, 1998. Local Organizing Committee.
- 1996-98, ASCE Wetlands Engineering and River Restoration Conference, Denver, March 20-29, 1998.
- 1992-94, International Conference on Wetland Management. Chair, Overseas Committee. Institution of Civil Engineers, London, June 1994.
- 1987-92, Co-organizer First, and Second International Conference on Hydraulic Modeling of Coastal, Estuarine, and River Waters, United Kingdom, September 1989 and 1992.

**HONORS AND AWARDS:**

Distinción, University of Concepción. For research leadership and contributions to the development of the Centro de Ciencias Ambientales, EULA-Chile, 2010.

University Research Professor of the Year Award, University of Idaho, 2008

Lemley International Individual Award for the Environment, 2007.

Outstanding Faculty Award, 2006. College of Engineering, University of Idaho.

Gledden Senior Fellowship, 2003

Fulbright Award, 2003-04

The DeVlieg Presidential Professorship, 2001-present

John and Maybelle Tucker Award, University of California, Berkeley, 1986

Hans Albert Einstein Memorial Award, UC Berkeley. 1985

Science and Engineering Research Council Award, 1983-85

Fulbright Scholarship, 1981-83

**Selected Student Awards**

Diego Caamano

Presidente de Republica Scholarship, Chile, 2004-2008.

University of Idaho, International Student of the Year, 2008.

Alex Garcia

Fulbright Scholarship, 2008. University of Concepción student scholarship.

S. Parkinson, 2003.

John F. Kennedy Prize. International Association for Hydraulic Research. One of three 2003 awards. "Response of White Sturgeon to Various Hydropower Operating Schemes". Proceedings of the XXX Biennial Conference. JFK Student Paper volume. 1-7.

D. Fuhrman, 1999.

Fulbright Scholarship, 1999. To Technical University of Delft, the Netherlands

## Delta Lead Scientist Interview Questions

*Why take this position?* You are a highly successful researcher and educator, with experience in administration. Your current job is by all measures an excellent and challenging job. Why are you interested in the position of the Delta Lead Scientist?

*Science in Support of Decision Making* – The Delta Plan is based on the premise that high quality science will inform policy development and resource management. Yet, in reality, the science is often incomplete with significant uncertainties. In your experience, what is the best way to deal with uncertainty and how might you help the decision making bodies meet their policy and management obligations?

*Advocacy Science* – Large restoration/water management projects are often affected by the use of selective science by stakeholders and/or agencies to advocate for specific actions. Based on your experience, what is the best way to handle this, particularly given the high stakes?

*Science and Policy Timeframes* – Multiple important policy initiatives are underway that are supported by or are linked to the Delta Science Program. The pace of these initiatives and their short deadlines are often out of synch with scientific research programs, yet the need for scientific support is large and immediate. In your view, what is the best way to address this problem?

*Communication of Complete, Accurate and Up-to-date Information* – As a follow-on to the previous question, policymakers who interact with the Delta Science Program have an ongoing need for synthesized, technically-accurate scientific information in a form that they can understand and incorporate into policy. Describe your experience with and insight into meeting this need.

*Collaboration* – Science in the Delta is produced by numerous agency, consultant and university scientists. This requires promoting the interaction and collaboration among a wide range of scientists and technicians working within different research cultures. For example, universities seek to publish their results in peer-reviewed journals, while some agency scientists prefer reports or oral communication. How would you approach integrating this science across these cultures?

*Resources* – Based on what you know now about the Lead Scientist position, what resources – personal and professional – do you feel are necessary for you to be successful in this job?

*Finally* – If you were offered the job, would you take it? If so, when could you start?

Wrap-up: Any follow-up questions from the panel?

**From:** Tom Birmingham  
**Sent:** Monday, September 5, 2011 10:16 AM  
**To:** 'Tony Coelho'; joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Subject:** FW: Lawsuit Heads-up:Etchegoinberry v. United States, U.S. Court of Federal Claims  
**Attachments:** Class Action Complaint\_ Etchegoinberry v. US [FILED 9-2-2011].pdf

Gentlemen,  
I should have copied you on this message.  
Tom

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Saturday, September 03, 2011 11:56 AM  
**To:** 'Costa, Jim'; 'zzCardoza, Dennis'  
**Cc:** 'Murray, Jaclyn'; 'D'Adamo, Dee Dee'; 'D Nelson'  
**Subject:** Lawsuit Heads-up:Etchegoinberry v. United States, U.S. Court of Federal Claims

Jim and Dennis,

I wanted to make sure you were aware that late Friday afternoon, several growers in Westlands Water District filed suit against the United States alleging that by the continued and ongoing failure of the United States to provide drainage, the plaintiffs have been deprived of the benefit of the full productive use of their farmlands and the value of the lands has been diminished. As a result, the plaintiffs claim that their lands have been taken by the United States for public use without just compensation, in violation of the Fifth Amendment to the U.S. Constitution.

The suit was filed in the United States Court of Federal Claims in Washington, DC. The plaintiffs have asked the court to certify their suit as a class action, so that it may be maintained on behalf of all Westlands landowners whose property has been physically invaded by saline groundwater due to the failure of the Secretary to fulfill his obligation to provide drainage to their lands.

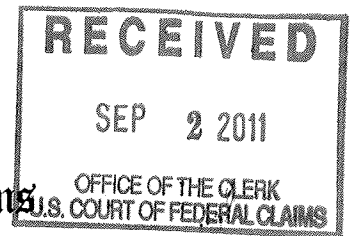
Please note that this action was not filed by the District, but by individual landowners with independent counsel. The Westlands board and staff have taken a "hands-off" approach to this matter. If asked by the press, Westlands staff will state that it is not appropriate for the District to comment on the litigation of independent parties.

I have provided you with a copy of the complaint. Please call if you have any questions.

Tom



FORM 2  
COVER SHEET



In The United States Court of Federal Claims

Cover Sheet

Plaintiff(s) or Petitioner(s)

Michael Etchegoinberry, Erik Clausen, Barlow Family Farms, L.P., a partnership, Christopher Todd Allen,  
for themselves and on behalf of all others similarly situated

If this is a multi-plaintiff case, pursuant to RCFC 20(a), please attach an alphabetized, numbered list of all plaintiffs.

Name of the attorney of record (See RCFC 83.1(c)): Katherine T. Gates  
Firm Name: Beveridge & Diamond, P.C.  
Post Office Box: \_\_\_\_\_  
Street Address: 1350 I Street, N.W., Suite 700  
City-State-Zip: Washington, D.C. 20005  
Telephone & Facsimile Numbers: Tel: (202) 789-6000; Fax: (202) 789-6190

Is the attorney of record admitted to the Court of Federal Claims Bar? ☒ Yes ☐ No

Does the attorney of record have a Court of Federal Claims ECF account? ☒ Yes ☐ No

If not admitted to the court or enrolled in the court's ECF system, please call (202) 357-6402 for admission papers and/or enrollment instructions.

Nature of Suit Code:

Select only one (three digit) nature-of-suit code from the attached sheet.

If number 213 is used, please identify partnership or partnership group. If numbers 118, 134, 226, 312, 356, or 528 are used, please explain.

Agency Identification Code:

See attached sheet for three-digit codes.

Amount Claimed:

\$ In excess of \$10,000

Use estimate if specific amount is not pleaded.

Disclosure Statement:

Is a RCFC 7.1 Disclosure Statement required? ☐ Yes ☒ No

If yes, please note that two copies are necessary.

Bid Protest:

Indicate approximate dollar amount of procurement at issue: \$ NA

Is plaintiff a small business? ☐ Yes ☒ No

Vaccine Case:

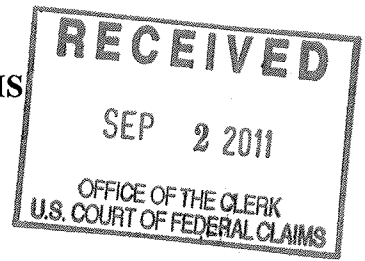
Date of Vaccination: NA

Related Cases:

Is this case directly related to any pending or previous case? ☐ Yes ☒ No

If yes, you are required to file a separate notice of directly related case(s). See RCFC 40.2.

IN THE UNITED STATES COURT OF FEDERAL CLAIMS



\_\_\_\_\_  
MICHAEL ETCHEGOINBERRY, ERIK )  
CLAUSEN, BARLOW FAMILY FARMS, L.P., )  
a partnership, and CHRISTOPHER TODD )  
ALLEN, for themselves and on behalf of all )  
others similarly situated, )

Plaintiffs, )

v. )

THE UNITED STATES, )

Defendant. )  
\_\_\_\_\_

No. \_\_\_\_\_

**CLASS ACTION COMPLAINT**

**INTRODUCTION**

1. Through this action, Plaintiffs seek just compensation from the United States for an uncompensated physical taking of their properties for public use in violation of the Fifth Amendment to the United States Constitution.

2. Plaintiffs are private property owners of farmlands located in the San Luis Unit service area of the Central Valley Project in Central California (collectively "Plaintiffs") and are all part of the Westlands Water District. Plaintiffs' farmlands have required drainage to maintain their agricultural productivity; the soil of these farmlands contain an impermeable clay layer not far below the surface which traps irrigation water when applied to the land and prevents it from draining naturally. Absent such drainage, wastewater settles beneath these lands, resulting in high water tables and the accumulation of saline groundwater. The higher water tables and increased groundwater salinity make the land unsuitable for farming. These conditions impact nearly 400,000 acres of farmland, including Plaintiffs' properties.

3. The United States has had a longstanding obligation to provide drainage of subsurface wastewaters from Plaintiffs' farmlands in this area, but it has reneged on its obligation and has made clear it will not satisfy this duty. As a result of undrained wastewaters, saline groundwater has accumulated beneath and upon and physically invaded Plaintiffs' properties, harming existing crops, reducing crop yields, limiting crop rotations, precluding certain types of crops from being planted, and deteriorating soil quality and conditions, among other adverse impacts. Plaintiffs have been deprived of the full benefit and use of their farmlands, and the value of their properties has been substantially reduced.

4. The United States has acknowledged for decades that drainage service is essential and mandated. On numerous occasions, the United States has promised that it would provide the required drainage service to Plaintiffs' farmlands. While facilities designed to drain Plaintiffs' farmlands were partially built by the United States and temporarily served a fraction of landowners in the drainage-impaired area, they were never extended to all landowners owed these services and they were never completed.

5. Almost twenty years ago, two federal district courts held that the United States has an unexcused duty to provide drainage to Plaintiffs' farmlands under the San Luis Act of 1960. *See Firebaugh Canal Co. v. United States*, No. CV-F-88-634 (E.D. Cal. Mar. 12, 1995); *Sumner Peck Ranch, Inc. v. Bureau of Reclamation*, 823 F. Supp. 715 (E.D. Cal. 1993). Eleven years ago, the United States Court of Appeals affirmed those rulings that imposed upon the United States an affirmative legal duty to provide drainage. *See Firebaugh Canal Co. v. United States*, 203 F. 3d 568 (9th Cir. 2000).

6. In response to these rulings, the United States represented it would satisfy its obligation to construct the facilities necessary to remove the saline groundwater from Plaintiffs'

properties. Prompted by the Ninth Circuit's *Firebaugh* ruling, the United States worked on developing and adopting a plan to fulfill this obligation. But the United States has since abandoned its plan and reneged on its drainage obligation.

7. Currently, none of Plaintiffs' farmlands are receiving any drainage service because the United States has failed to provide it. The United States' continuous failure to provide drainage through the present day has resulted in high water tables and in saline groundwater beneath and upon Plaintiffs' properties, which have been the direct, natural or probable result of the United States' shirking of its drainage obligation.

8. Moreover, because Plaintiffs' farmlands have been subject and are currently subjected to the adverse effects attendant to the continuous absence of drainage facilities the United States has been obligated to provide, the combined effect of the rising water table and the accumulation of saline groundwater beneath and upon their properties has deprived Plaintiffs' of the benefit of the productive use of their farmlands, and the value of their farmlands has been reduced.

9. Accordingly, Plaintiffs seek just compensation for the physical invasion and occupation of their properties.

### **JURISDICTION**

10. This Court has jurisdiction over the claim in this Complaint under 28 U.S.C. § 1491 (The Tucker Act) as a "claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States." This is a claim seeking compensation for the taking of private property for public use without just compensation, which is actionable pursuant to the Fifth

Amendment to the United States Constitution. Plaintiffs seek just compensation in an amount that exceeds \$10,000 on this claim for relief.

### **PARTIES**

11. Plaintiff Michael Etchegoinberry, an individual, is a landowner in the San Luis Unit service area who has owned approximately 139 acres of farmland (the real property located at Fresno County Assessor Parcel Numbers 028-170-31s, 028-170-32s, 028-170-63s, and 028-170-76s) in the drainage-impaired area of the Westlands Water District since April 23, 2008.

12. Plaintiff Erik Clausen, an individual, is the assignee for claims related to the diminished value and use of farmlands owned by the Jorgen and Kristine Clausen Family Trust, a landowner in the San Luis Unit service area that has owned 638 acres of farmland (the real property located at Fresno County Assessor Parcel Numbers 050-020-14s and 050-060-20s) in the drainage-impaired area of the Westlands Water District since July 12, 2007. The assignment was made on August 25, 2011, for valuable consideration of \$25,000.

13. Plaintiff Barlow Family Farms, L.P. is a California limited partnership for which Eric Barlow is a partner. Barlow Family Farms is a landowner in the San Luis Unit service area which has owned approximately 640 acres of farmland (the real property located at Fresno County Assessor Parcel Number 060-190-18s) in the drainage-impaired area of the Westlands Water District since December 10, 2007.

14. Plaintiff Christopher Todd Allen, an individual, doing business as Todd Allen Ranch, is a trustee of the Todd Allen and Cheryl Lynn Allen Family Trust, a landowner in the San Luis Unit service area which has owned approximately 165 acres of farmland (the real property located at Fresno County Assessor Parcel Number 011-130-15s) in the drainage-impaired area of the Westlands Water District since October 16, 2007.

15. Defendant United States of America is a republic formed pursuant to the Constitution of the United States, and exercises the powers described therein subject to certain limitations, including the Fifth Amendment to the United States Constitution.

### **CLASS ACTION ALLEGATIONS**

16. Plaintiffs bring this action as a Class Action under Rules of the United States Court of Federal Claims ("RCFC") 23(b) on behalf of a class defined as follows:

All landowners located within the Westlands Water District ("Westlands" or "District") and served by the San Luis Unit of the Central Valley Project whose farmlands have not received the necessary drainage service the United States is required to provide under the San Luis Act (Pub. L. No. 86-488, 74 Stat. 156 (1960)).

17. As used herein, Plaintiffs refers to the named Plaintiffs and the class they represent. The class is so numerous that joinder of all members is impracticable. There are more than 650 Westlands landowners in the San Luis Unit whose farmlands' productivity has been impaired and value diminished because they have not received the necessary drainage service.

18. There are questions of law and fact common to the class. The principal issue in this case is the physical invasion of Plaintiffs' farmlands with saline groundwater resulting from the United States' failure to drain subsurface wastewaters from those properties. The United States' failure to provide drainage to Westlands landowners has affected the entire class, thus making final relief appropriate with respect to the class as a whole. The common questions of law and fact involved in this action thus predominate over individual questions.

19. Plaintiffs' claims and their requested relief are typical of the claims of and relief sought by the class. The claims of the named Plaintiffs and the class members arise from the same set of facts and are premised upon the same legal theories under the Fifth Amendment of the United States Constitution.

20. The named Plaintiffs will adequately and fairly protect the interests of the class.

The named Plaintiffs and class members possess the same interest. They have suffered the same or similar injury—the taking of property rights—as a result of the United States’ failure to provide drainage to their farmlands. Further, they seek the same remedy—just compensation resulting from the physical invasion of their lands with saline groundwater resulting from the United States’ failure to provide drainage. Having represented classes in the past, counsel for the named Plaintiffs and the class has (a) experience in handling complex litigation; (b) knowledge of the applicable laws; and (c) adequate resources to commit to representing the class.

21. A class action is the superior method for a fair and efficient adjudication of this controversy and substantial benefits will derive from proceeding as a class action. Such treatment will permit numerous similarly situated persons to prosecute their common claims jointly in a single forum and thus avoids unnecessary duplication. A class action provides an efficient, manageable method to adjudicate fairly the rights and obligations of the named Plaintiffs and class members.

## **BACKGROUND**

### **The Central Valley Project**

22. The Central Valley Project is a United States Department of the Interior, Bureau of Reclamation (“Bureau”) federal water project in California, designed to conserve state waters and put them to maximum beneficial use. The largest reclamation project of its kind in the country, the Central Valley Project spans the length of California’s expansive Central Valley.

23. In 1952, the Westlands Water District was formed by the Fresno County Board of Supervisors upon petition by landowners in the region who sought to protect their farmlands. Through the District, the landowners sought to bring in Central Valley Project water to their

farmlands on the west side of the San Joaquin Valley. The District encompasses large areas of land which, by reason of soil conditions, now, and at all times relevant hereto, require drainage to maintain the agricultural productivity of the land. Without drainage service, saline groundwater builds up and accumulates beneath the farmlands, making them unsuitable for farming. These high water tables and the accumulation of saline groundwater eventually damage and destroy the agricultural productivity of the farmlands and diminish their value.

24. In order to bring water from the Central Valley Project into Westlands, the infrastructure to convey water to the Westlands area needed to be constructed. The San Luis Unit was built by the Bureau to serve that purpose.

#### San Luis Unit

25. In 1956, pursuant to Section 9(a) of the Reclamation Project Act of 1939, the Bureau sent Congress a report entitled the "San Luis Unit, Central Valley Project," which examined the feasibility of water supply development in the area that was to be encompassed by the San Luis Unit. The report recommended construction of the San Luis Unit, while acknowledging an anticipated drainage problem in the area that would make soils unsuitable for irrigation use if no drainage system were provided. The report recommended a drainage system for the region that would dispose of saline groundwater.

26. In 1960, Congress passed the San Luis Act (Pub. L. No. 86-488, 74 Stat. 156 (1960)). The San Luis Act authorized the United States Department of the Interior ("Interior") to "construct, operate and maintain the San Luis Unit as an integral part of the Central Valley Project." The principal purpose of the San Luis Unit was to furnish irrigation to land in Merced, Fresno, and Kings Counties in California, such as the farmlands belonging to Plaintiffs. But the San Luis Act also required the United States to provide drainage service to Westlands, since the



United States knew that the application of Central Valley Project water for irrigation in Westlands would require that drainage be provided to these lands. For this reason, Congress expressly conditioned the construction of the San Luis Unit on the provision of drainage facilities.

27. The drainage facilities contemplated in the 1956 feasibility report for the San Luis Unit, prepared by Interior and referred to in the San Luis Act, included a system of on-farm, subsurface drains that were to be connected to a local drainage collection system. The local drainage collection system would empty into an interceptor drain that would convey wastewater to the Sacramento-San Joaquin Delta for disposal.

28. Interior gave Congress written assurance that the drainage facilities described in the 1956 feasibility report would be provided to the lands in the San Luis Unit needing such services before construction of the San Luis Unit commenced.

#### Westlands Contracts

29. In order to secure the appropriate water and drainage services, Westlands negotiated several contracts with the United States. The first was a water service contract that guaranteed Westlands' long term water supply from the San Luis Unit and recognized the accompanying need for drainage. The second was a contract for construction of the water distribution and drainage system to remove subsurface wastewaters from District farmlands. Interim contracts extending these services and commitments followed.

#### *1963 Contract*

30. On June 5, 1963, Westlands and the United States entered into the "Contract Between the United States and Westlands Water District Providing for Water Service," Contract No. 14-06-200-495A ("1963 Water Service Agreement"). Westlands entered into this agreement

for the purpose of obtaining a long-term, reliable source of irrigation water for District farmlands as well as drainage service to prevent damage to those lands.

31. The 1963 Water Service Agreement established a contract rate per acre-foot of Central Valley Project water delivered to Westlands landowners, which Interior, in its judgment, determined would produce revenues sufficient to repay Westlands' share of the costs of constructing, operating and maintaining the major project facilities of the Central Valley Project and the San Luis Unit, including the San Luis Drain, and the construction of works connected with the irrigation system.

32. The 1963 Water Service Agreement recites that the United States is "providing an interceptor drain to meet the drainage requirements" of the San Luis Unit and that Westlands "desires to contract . . . for drainage service by means of the interceptor drain . . . ." The agreement defined the "interceptor drain" as the "physical works constructed by the United States pursuant generally to [the San Luis Act] in order to meet the drainage requirements of the area served by the San Luis Unit . . . ."

33. The 1963 Water Service Agreement provided for the connection of the local drainage collection system from farmlands in the District to the San Luis Drain by establishing that such local drainage facilities of the District "may be connected to the interceptor drain" in such capacity and at such locations as may be mutually agreed upon. On-farm, subsurface drains were to be constructed on District farmlands that would tie into the local drainage collection system that connected to the interceptor drain.

34. The 1963 Water Service Agreement also provided that the per acre-foot water rate "shall include a drainage service component of not to exceed Fifty cents (\$0.50) for the interceptor

drain.” This service component paid to provide drainage service furnished by the United States by means of the San Luis Drain.

35. Plaintiffs’ farmlands are within the area contemplated to be provided with this drainage system.

#### *1965 Contract*

36. On April 1, 1965, Westlands and the United States entered into the “Contract Between the United States and Westlands Water District Providing for the Construction of a Water Distribution and Drainage Collection System,” Contract No. 14-06-200-2020A (“1965 Repayment Contract”). Westlands also entered into this contract to obtain drainage services that would ensure the productivity of District farmlands and prevent damage resulting from rising saline groundwater.

37. The 1965 Repayment Contract recites that Westlands “desires that a water distribution and drainage collector system be constructed for the District by the United States acting by and through the Bureau of Reclamation, United States Department of Interior” and that the United States is “willing to undertake the construction of the aforementioned water distribution and drainage collector system” under the terms of the contract. The contract makes clear that the water distribution system to be built encompasses “a drainage collector system and related facilities.” The contract further obligates the United States and the District to “exert their best efforts to expedite the completion of such features.”

38. Further, the 1965 Repayment Contract provides that the first construction group “shall include substantially all of the . . . drainage collector facilities . . . as initially required to serve the area” encompassed by the first construction group. It further adds that “[c]hanges in . . . locations . . . as may . . . be expedient, economical, necessary, or advisable to the extent that such changes do not substantially change the basic character or service capability . . . may be made.”

39. Under the 1965 Repayment Contract subsequent construction on the remaining two construction groups was to be started “no later than June 30, 1974, and June 30, 1979, respectively.”

40. Plaintiffs’ farmlands are within the area contemplated to be serviced by the drainage collector facilities.

#### *Interim Contracts*

41. Since the expiration of the 1963 Water Service Agreement at the end of 2007, Westlands and the United States have entered into two interim renewal contracts for the delivery of water: Interim Renewal Contract Between the United States and Westlands Water District Providing for Project Water Service, San Luis and Delta Division (effective through February 28, 2010) (“2007 Interim Contract”) and Interim Renewal Contract No. 14-06-200-495A-IR2 (effective through February 29, 2012) (“2010 Interim Contract”).

42. In addition to extending the United States’ obligation to provide water to Westlands for irrigation purposes, the 2007 Interim Contract and 2010 Interim Contract carry over the United States’ obligation to provide drainage services to the District and its landowners’ farmlands.

#### Incomplete Drainage Construction

43. In approximately 1968, the Bureau began construction of the San Luis Drain.

44. The San Luis Drain was a principal engineering feature of the San Luis Unit. Its function was to serve as the main drain for the drainage service area for the water districts in the San Luis Unit, including Westlands. Thus, it was intended to receive drainage water from Plaintiffs’ farmlands via the drainage collector system constructed under the 1965 Repayment Contract and to convey it to another location for discharge or disposal.

45. As originally planned by the Bureau, an outlet was to be constructed to discharge drainage water via the San Luis Drain into the Sacramento-San Joaquin Delta.

46. In 1972, the Bureau completed its first stage of construction, which included the Kesterson Reservoir in Gustine, California and the adjacent reach of the San Luis Drain.

47. By 1975, the San Luis Drain had been extended southward to Westlands. The Bureau stopped construction of the San Luis Drain at Kesterson, a point approximately 60 miles north of Westlands, a little less than half the distance to the planned discharge point in the Sacramento-San Joaquin Delta, citing environmental questions and concerns.

48. Beginning in approximately 1976, the United States constructed the first phase of the drainage collector system to serve an area of approximately 42,000 acres in the northeastern part of Westlands, near the town of Mendota. This 42,000-acre area was only a fraction of the nearly 400,000-acre, drainage-impaired area that was to be served by the complete drainage collector system.

49. A year before the first phase of construction concluded in 1979, the United States advertised for bids for the construction of the second phase of the drainage collector system, which would have expanded the drainage service area to the south to serve an additional area of approximately 57,000 acres, another fraction of the overall drainage-impaired area that the drainage collector system was intended to reach.

50. But the United States rejected all bids and did not award the proposed second-phase construction contract because the Bureau determined that there were insufficient funds in the authorization limit set forth in the San Luis Act for local distribution systems and drains to pay for the remaining construction.

51. In making that determination, the United States improperly accounted for costs of the San Luis Drain, a major project facility subject to a different statutory authorization limit, as if it were a local drainage collection facility to be charged against the Act's \$192,650,000 authorization limit. In 1986, the Solicitor of Interior ruled that it had been improper to charge the cost of the San Luis Drain against this authorization limit for local distribution systems and drains, and that said costs should have been charged against the San Luis Act's separate authorization limit of \$290,430,000 (indexed to 1960 dollars) applicable to major project facilities. Nevertheless, the United States did not construct the second phase of the drainage collector system.

52. Since no construction of drainage facilities was completed beyond the first phase of construction, between approximately 1977 and 1986, only farmlands in the 42,000-acre drainage service area received drainage service. Thus, drainage service was only partial, since thousands of acres of drainage-impaired farmlands located outside the 42,000-acre area never received drainage service. For the 42,000 acres of farmlands that did receive drainage, the benefit was only temporary, lasting until 1986, when the United States plugged the only section of the drainage collector system it had built.

#### Kesterson Reservoir

53. For the farmlands that received temporary drainage services, Kesterson Reservoir ("Kesterson") served as a terminal disposal site for their drainage waters since the San Luis Drain was never completed to the north of Kesterson. Kesterson, which was designed and constructed by the Bureau and has been operated by the Bureau, was intended to be a regulating reservoir for the San Luis Drain between Kesterson and the Sacramento-San Joaquin Delta. Since the San Luis Drain was never completed, however, the Bureau repurposed Kesterson as the terminal disposal site for drainage water from the 42,000-acre drainage-service area. Kesterson had also been

designated as a National Wildlife Refuge based on a 1972 agreement between the Bureau and the United States Fish and Wildlife Service ("Fish & Wildlife").

54. Kesterson became essential to providing drainage service to Westlands because no discharge outlet for the 42,000 acres was ever provided by the United States. But the capacity of Kesterson Reservoir was insufficient to provide drainage service to any lands outside of the 42,000-acre drainage-service area, or to any lands within the 42,000-acre drainage-service area for which on-farm subsurface drains had not been installed by the early 1980s.

55. Drainage water was disposed of at Kesterson by evaporation. This disposal method concentrated naturally occurring selenium and various other constituents in the water, soils and plants at Kesterson. If the San Luis Drain had been completed, the concentration of selenium and other constituents would have been diluted and mixed with the waters of the Delta, Bay and Pacific Ocean by river outflow and tidal action.

#### The Closure of Kesterson and the San Luis Drain

56. In 1983 and 1984, deformities and mortalities were noted in some of the waterfowl at Kesterson. These deformities and mortalities appear to have been caused when the waterfowl fed on plants and animals at Kesterson, which contained high concentrations of selenium.

57. In February 1985, the California State Water Resources Control Board issued a Cleanup and Abatement Order against the Bureau, requiring it to clean up Kesterson or close down its operations as a drainage disposal facility by February 1988.

58. In March 1985, Interior announced that it had instructed Fish & Wildlife to begin the process of plugging the San Luis Drain and shutting down Kesterson, a process that, it was announced, was to result in closing off the drainage collector system serving the 42,000-acre

drainage-service area from the San Luis Drain and/or halting the delivery of irrigation water to lands that then drained into Kesterson.

59. On April 3, 1985, Westlands entered into an agreement with the United States which obligated the Bureau to continue to provide water service to the 42,000-acre drainage-service area and required that Westlands reduce the flow of drain water from the area into Kesterson and certain portions of the San Luis Drain in accordance with a short time schedule. If the short time schedule could not be met by providing alternative means of disposal, Westlands was required to close the drains at the collector system, and if it did not, Interior reserved the right to close the drains at Westlands' expense. Westlands' agreement to the terms of the April 3, 1985 Agreement was the direct result of the threat by the United States to halt certain deliveries of irrigation water to Westlands.

60. The April 3, 1985 Agreement reserved the rights of the parties regarding the delivery of irrigation water and "the disposition of drain water for future negotiation or litigation, including but not limited to, Westlands' claim of right to adequate drainage service by the United States for all lands within Westlands needing such service."

61. Westlands undertook a number of projects to replace Kesterson as a disposal site for the drainage water to meet the schedule for flow reductions in the San Luis Drain required by the April 3, 1985 Agreement. These projects allowed the initial flow reduction to be met but proved unsuccessful with regard to providing a site and an economically and technically feasible method for disposing of the wastewaters being produced in the 42,000-acre drainage-service area. As a result, the time schedule for the reduction and elimination of flows in the San Luis Drain could not be met. The drains in the collector system were physically plugged in 1986 in order to stop the flow of wastewaters from Westlands into the San Luis Drain.



62. At the time drainage services to District farmlands were shut down by the United States, approximately 85 miles of the San Luis Drain, extending from Kesterson in the north to Five Points Ranch, California in the south, had been constructed. The San Luis Drain was never constructed north of Kesterson to the planned point of discharge.

63. Since June 1986, no drainage service has been provided by the United States to any landowner in the District. At all times, however, the United States has had a duty to provide drainage service to farmlands in the District, including a method for the disposal of subsurface wastewater accumulating under Plaintiffs' farmlands.

64. The United States' continuous failure to provide drainage through the present day—for both the 42,000-acre area that temporarily received drainage and the remainder of the District that never received drainage—has resulted in the high water tables and saline groundwater that had long been recognized as a threat to the agricultural productivity of District farmlands, including Plaintiffs' properties. The adverse impacts characteristic of high water table and saline groundwater—limited crop rotations, decreased crop yields, stunted or retarded crop growth, decreased crop yields, sterile land precluding any crop growth, poor soil quality and conditions—have been the direct, natural or probable result of the United States' shirking of its drainage obligation. Plaintiffs have been deprived of the benefit of the full productive use of their farmlands, and the value of their farmlands has been reduced.

#### Drainage Litigation

##### *The Barcellos Judgment*

65. In 1986, a stipulated judgment in *Barcellos & Wolfsen, Inc. v. Westlands Water District*, No. CV-79-109 EDP (E.D. Cal. filed Apr. 26, 1979) and *Westlands v. United States*, No. CV-81-245 EDP (E.D. Cal. filed 1981) (the "*Barcellos Judgment*") settled a consolidated action

involving Westlands, landowners and water users within Westlands, and the Bureau. *Barcellos*, No. CV-79-109 EDP (E.D. Cal. Dec. 30, 1986). In addition to addressing the supply of water to Westlands, the *Barcellos* Judgment also addressed the provision of drainage services to the District.

66. The *Barcellos* Judgment preserved claims against the United States concerning the right to drainage service or drainage service facilities. It provided that any claims against the United States concerning the right to drainage service or drainage service facilities could be asserted only upon the occurrence of certain conditions specified therein, including conditions relating to a drainage plan, which the United States was required to submit to Westlands by December 31, 1991. The drainage plan was required to include drainage service facilities with sufficient aggregate capacity to transport, treat, and dispose of not less than 60,000-acre-feet and not more than 100,000-acre-feet of subsurface drainage water per year from Westlands by December 31, 2007, and was also required to be cost effective, financially feasible, and capable of acquisition, construction, and operation in compliance with all applicable laws. The *Barcellos* Judgment provided for the creation of a trust using funds collected from Westlands' landowners to pay the costs of the design and construction of these drainage service facilities. Further, it also allowed the "revival of any claims against the United States of the right to drainage service or Drainage Service Facilities" if the United States failed to adopt a drainage plan by 1991 that met the necessary requirements.

#### *The Firebaugh Canal and Sumner Peck Cases*

67. In 1988, the Firebaugh Canal Water District and landowners affected by the drain closures of 1986 filed suit against the United States Bureau of Reclamation and Westlands for various forms of relief related to drainage. *Firebaugh Canal Co. v. United States*, No. CV-F-88-634 (E.D. Cal. filed December 9, 1998). In 1991, certain landowners also filed suit against the

United States and Westlands for various forms of relief related to drainage. *See Sumner Peck Ranch v. Bureau of Reclamation*, No. CV-F-91-048 (E.D. Cal. filed January 31, 1991).

68. In May 1992, the two cases were partially consolidated to resolve the mutual allegation that Interior was required by law under the San Luis Act to construct facilities to drain subsurface water from District farmlands.

69. In May 1993, the district court ruled that “[t]he San Luis Act requires [Interior] to make provision for drainage for the San Luis Unit as specified in the Act. The failure to do so violates the Act.” *Sumner Peck*, No. CV-F-91-048 (E.D. Cal. May 14, 1993) (order granting plaintiffs’ motion for partial summary judgment).

70. Thereafter, the district court ordered a trial on the issue of whether or not the duties of the United States to provide drainage service to Westlands and its landowners had been excused by subsequent legislation, impossibility, impracticability, or any other reason. *Id.*

71. In December 1994, the district court reprimanded the United States for not having “undertaken activities to complete the drain” since the court had issued its May 1993 order declaring that the San Luis Act required completion of the drain and issued the following findings of fact:

- “Since the mid-1980s, the Bureau has not undertaken any efforts to complete the San Luis Drain in order to physically remove saline subsurface agricultural drainage water from the drainage service area.
- . . . .
- The [United States] ha[s] failed to take necessary steps to provide drainage for a number of years. The Bureau is unlikely to undertake efforts to provide drainage service unless ordered to do so by the Court.
- The Court finds that the federal agencies that have responsibility for providing drainage to the San Luis Unit have not effectively addressed the serious problems of water-logging and salt accumulation that are destroying the plaintiffs’ ability to farm their lands in the San Luis Unit.”

*Sumner Peck*, No. CV-F-91-048 (E.D. Cal. Dec. 2, 1994) (findings of fact and conclusions of law).

72. The district court also found that the United States' obligation to provide drainage services contemplated by the San Luis Act was not foreclosed or excused by factual or legal impossibility, illegality, implied repeal, or any other reason. *Id.*

73. In addition, the district court issued the following conclusions of law:

- "The Secretary of the Interior through the Bureau of Reclamation has made the policy decision not to complete the San Luis Drain, in violation of Section 1 of the San Luis Act. This action constitutes agency action unlawfully withheld.
- The Secretary must be provided the opportunity to comply with the law to provide drainage to the San Luis Unit."

*Id.*

74. In 1995, the district court echoed these conclusions in a ruling on a partial motion for summary judgment for plaintiffs, holding that the United States had a statutory duty to provide drainage and issuing a permanent injunction commanding the United States to apply for the permits necessary to complete the San Luis Drain. *Firebaugh Canal Co. v. United States*, No. CV-F-88-634 (E.D. Cal. Mar. 12, 1995) (partial findings of fact and conclusions of law regarding statutory duty). Interior appealed this judgment.

75. In 2000, the U.S. Court of Appeals for the Ninth Circuit affirmed the substantive rulings of the district court's 1993 order and 1995 judgment. The Ninth Circuit ruled that the United States had made a deliberate policy decision not to provide drainage, and that such decision was in violation of the unambiguous mandatory drainage duty enacted by Congress in the San Luis Act. It rejected the United States' defenses based on appropriation riders, factual and legal impossibility, and impracticability. Accordingly, the Ninth Circuit required the United States to provide drainage to the San Luis Unit pursuant to the San Luis Act "without delay." *Firebaugh Canal Co. v. United States*, 203 F. 3d 568 (9th Cir. 2000) ("Ninth Circuit Opinion").

76. The Ninth Circuit Opinion also held that since 1992, Congress had given the United States supplemental authority as to how to provide drainage, and the court therefore reversed and remanded the district court injunction as invading an area of administrative discretion in directing how Interior was to fulfill its statutory duty to provide drainage. *Id.*

77. Thereafter, upon remand, the district court issued a new permanent injunction directing the United States to provide drainage to the San Luis Unit promptly and without delay. Rather than directing the United States to complete the original drainage plan, the district court ordered the United States to submit a new plan by January 29, 2001, for promptly providing the required drainage. *Sumner Peck*, No. CV-F-91-048 (E.D. Cal. Dec. 18, 2000) (order modifying partial judgment on findings of fact and conclusions of law regarding statutory duty) (“Drainage Order”).

78. Since issuing the Drainage Order, the district court has been overseeing its implementation, and the parties in the partially consolidated *Firebaugh* and *Sumner Peck* actions regularly apprise the court of the status of compliance with the order.

United States’ Ongoing Refusal to Implement the Drainage Order and  
Failed Negotiations for Alternative Resolution to Drainage Problem

79. In 2001, the United States began development and analysis of various alternatives that would address the United States’ obligation to provide Westlands landowners drainage pursuant to the Drainage Order. In April 2001, the Bureau developed the San Luis Drainage Feature Re-evaluation Plan of Action, which outlined its proposed efforts to provide prompt drainage service based on its consideration of a variety of options. In December 2001, the Bureau issued the San Luis Unit Drainage Feature Re-evaluation Preliminary Alternatives Report, which identified the range of options for drainage systems that could be utilized.

80. In December 2002, the Bureau published the Plan Formulation Report, San Luis Drainage Feature Re-evaluation, which set forth the analysis of the alternatives for providing drainage to the San Luis Unit and identified the proposed action the Bureau would pursue to meet the United States' drainage obligation.

81. In July 2004, the Bureau filed an Addendum to its Plan Formulation Report, San Luis Drainage Feature Re-evaluation, which further refined the components of the proposed action. The Addendum additionally set forth a timeline for completion of an Environmental Impact Statement and Record of Decision.

82. In May 2006, the Bureau released its Final Environmental Impact Statement related to the San Luis Drainage Feature Re-evaluation, which provided a detailed evaluation of the drainage options.

83. By early 2006, the *Firebaugh* and *Sumner Peck* parties also began settlement negotiations to seek an alternative resolution of the drainage issue. As a result of these settlement discussions, the Bureau delayed execution of its Record of Decision.

84. In March 2007, the Bureau signed a Record of Decision for the San Luis Drainage Feature Re-evaluation ("ROD"), in which the Bureau selected the "In-Valley/Water Needs Land Retirement Alternative" as the project to fulfill its drainage obligation to Plaintiffs' farmlands in the San Luis Unit.

85. The selected "In-Valley/Water Needs Land Retirement Alternative" included drainage reduction measures, drainage water reuse facilities, and treatment systems, as well as the retirement of nearly 200,000 acres of land from irrigated farming.

86. The ROD suggested that implementation of the In-Valley/Water Needs Land Retirement Alternative would likely require new authorizing legislation to increase the

appropriations ceiling for funding beyond what was authorized by the San Luis Act, and that appropriation of such funds by Congress would be needed.

87. In July 2008, the Bureau completed and submitted to the United States Congress its San Luis Drainage Feature Re-evaluation Feasibility Report, which presented Congress with the relative economic benefits and costs of the Project, as outlined in the ROD.

88. The July 2008 Feasibility Report estimated that approximately 12 years of design and construction work would be necessary to implement the drainage system under the In-Valley/Water Needs Land Retirement Alternative.

89. Accordingly, the July 2008 Feasibility Report set forth a number of recommended Congressional actions needed for implementation of the ROD, including raising the San Luis Act appropriations ceiling for distribution systems and drains and making other specific changes to reclamation laws.

90. In late 2008, pursuant to their ongoing negotiations, the *Firebaugh* and *Sumner Peck* parties, the Bureau, and other stakeholders convened to reach an alternative negotiated resolution of the drainage issues. By January 2009, legislative language had been drafted for Congressional authorization on this resolution. Ultimately, however, no consensus on a draft legislative proposal was achieved, no legislative language was ever finalized or submitted to Congress, and the settlement discussions ended in failure.

91. Meanwhile, in July 2009, the Bureau reported that, due to the change in the presidential administration of the United States, it was unable to report to the district court as to when it would provide drainage to the San Luis Unit pursuant to the Drainage Order. The district court ordered the United States to “provide a report . . . identifying what specific actions will be taken to provide drainage to the San Luis Unit and a specific time table to implement drainage” by

late October 2009. The district court provided notice that “no further delay shall be permitted in this case and in the event the [United States] continue[s] to fail and refuse to provide the drainage long ago ordered by the Courts, this case shall proceed to an enforcement of judgment stage.”

*Firebaugh*, No. CV-F-88-634 (E.D. Cal. July 22, 2009) (scheduling conference order).

92. In October 2009, the Bureau submitted to the district court a report that failed to provide any timetable to implement the drainage in any area in the San Luis Unit. The Bureau did not describe any efforts made to implement the ROD or to seek the necessary Congressional actions to implement the ROD. Rather, the Bureau reported that Congress had not acted on the recommendations contained in the 2008 Feasibility Report and stated that it was unclear when Congressional action on the report would occur. The Bureau further acknowledged that no consensus on a draft legislative proposal for an alternative drainage resolution was achieved.

93. In November 2009, the Bureau reported to the district court that it would commence implementation of the 2007 ROD, within the Bureau’s existing authorities and the existing appropriations ceilings under the San Luis Act and subject to applicable law and the availability of funds appropriated by Congress for this purpose. However, due to appropriations ceilings, implementation was to be initially limited to one sub-unit of drainage facilities in Westlands’ northern sub-unit. Additionally, the Bureau again reaffirmed its “intention to finalize the elements of a legislative proposal on a long-term drainage strategy” that the United States could support by the end of 2009.

94. In November 2009, the Bureau submitted a Control Schedule detailing the actions it intended to pursue for the decade between 2010 and 2019. The Control Schedule proposes limited expenditures for only Westlands’ northern sub-unit and fails to account for a complete drainage



solution for the full expanse of drainage impaired farmlands in the District as contemplated by the ROD.

95. By the end of 2009, contrary to its representation to the district court, the Bureau did not finalize any legislative proposal on a long-term drainage strategy.

96. On September 1, 2010, the Bureau submitted to Senator Dianne Feinstein of California a letter that included elements of a new alternative drainage strategy that contravened the 2007 ROD, which had been adopted by the Bureau and which the Bureau had previously agreed to implement. Rather than focusing on legislation to increase the appropriations ceiling under the San Luis Act for implementation of the ROD, the Bureau's letter to Senator Feinstein presented an alternative strategy whereby, instead of implementing the ROD, Westlands and other San Luis Unit water districts would assume the responsibility for drainage service. Pursuant to this approach, all costs would be transferred to the San Luis Unit water districts. Nothing in the letter to Senator Feinstein involved or was directed at lifting the appropriations ceiling erected by the San Luis Act.

97. In November 2010, the Bureau deflected requests made by Westlands for an informational hearing to ascertain the Bureau's intent with respect to seeking passage of the necessary legislation for implementation of the ROD and on what schedule. No informational hearing was held.

98. On April 1, 2011, the Bureau submitted to the district court its most recent status report, which makes no mention of any efforts by the United States to seek any long-term legislative strategy for implementation of the ROD, as would be required for its execution.

99. On April 7, 2011, the District responded to the Bureau's September 1, 2010 letter with a letter to Senator Feinstein as well as the Bureau. The District expressed its vehement

opposition to the Bureau's alternative drainage strategy and stated it would vigorously oppose any legislation that repudiated the 2007 ROD that the Bureau had previously committed to implement.

100. To date, Congress has not acted to adopt the legislative changes described in the 2008 Feasibility Report necessary to raise the appropriations ceiling for implementation of the ROD that would provide drainage to Plaintiffs' farmlands.

101. To date, Interior has not presented Congress with proposed legislation for a long term drainage strategy for implementation of the 2007 ROD.

102. To date, Westlands' landowners have not reached any agreement or settlement with the United States regarding a negotiated, alternative drainage resolution for Plaintiffs' farmlands.

103. To date, the United States has not fulfilled its obligations to provide drainage to Plaintiffs' farmlands.

#### Losses and Injuries to Use and Value of Farmlands

104. As a result of the United States' continuous and ongoing failure to provide the required drainage to the present day, Plaintiffs have incurred, and are threatened with the continuation and increase of various losses as a result of the lack of drainage, with corresponding invasive high water tables and accumulation of saline groundwater salts beneath and upon Plaintiffs' farmlands. Plaintiffs' farmlands have been subject to adverse impacts that include, but are not limited to, reduced crop yields, limited crop rotations, restrictions on the types of crops that can be grown, and changes to soil quality and conditions. All Plaintiffs have been deprived of the benefit of the full productive use of their farmlands, and the value of their farmlands has been diminished.

#### **CLAIM FOR RELIEF** **Taking of Property Without Just Compensation**

105. Plaintiffs reallege and incorporate by reference Paragraphs 1 through 104, inclusive.

106. The United States has taken Plaintiffs' farmlands for public use without just compensation. The properties taken include, but are not limited to, flowage and seepage easements upon Plaintiffs' lands.

107. High water tables and the accumulation of saline groundwater beneath and upon Plaintiffs' properties are substantial, intermittent, frequent and inevitably recurring, and the interference and physical invasion by way thereof has stabilized and become permanent in nature.

108. High water tables and the accumulation of saline groundwater beneath and upon Plaintiffs' properties are the natural and probable consequence of the actions and inactions of the United States, including its failure to fulfill its continuing duty to provide drainage, and are the direct, proximate, and foreseeable result of said actions and failures to act.

109. Plaintiffs and their fellow Westlands landowners have at no time deviated from their contracts or the intended purposes of the San Luis Unit, nor used irrigation water in any improper or negligent way. Instead, at all times they have used such water to irrigate their crops in the normal, ordinary, and intended way.

110. The United States has failed to pay Plaintiffs just compensation for the taking of their properties, in violation of the Fifth Amendment to the United States Constitution, which provides, in part: "[N]or shall private property be taken for public use, without just compensation." U.S. CONST. AMEND. V.

111. As a direct and proximate result of the high water tables and the accumulation of saline groundwater beneath and upon their farmlands due to the actions and inactions of the United States, Plaintiffs' use of their properties has been impaired, and their properties have been substantially devalued and taken but uncompensated for in an amount as yet unascertained.

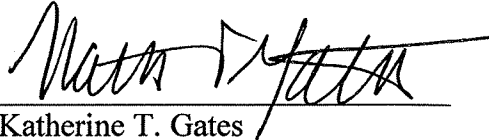
**REQUEST FOR RELIEF**

WHEREFORE, Plaintiffs pray for relief as follows:

1. That this matter be maintained and certified as a class action on behalf of all those landowners in the Westlands Water District whose lands have been physically invaded by saline groundwater as a result of the United States' failure to provide drainage to their farmlands;
2. Just compensation in an amount that exceeds \$10,000 on the claim for relief for Plaintiffs and all persons similarly situated;
3. Prejudgment interest on any just compensation or money judgment awarded;
4. Attorneys' fees, expert witness fees, and other costs incurred herein; and
5. Such other and further relief as this Court may deem just and proper.

Respectfully submitted,

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**From:** Frances Brewster

**Sent:** Tuesday, September 6, 2011 1:12 PM

**To:** Valerie Connor (vconnor@sfcwa.org); Lloyd Fryer (lfryer@l-squared.com); Rick Sitts; Jerry Johns; Sheila Greene (sgreene@westlandswater.org)

**Subject:** New Salmon Article

**Attachments:** Thompson11.pdf

**Warming streams could be the end for salmon** , UC Davis, Sep 1, 2011

[http://www.news.ucdavis.edu/search/news\\_detail.lasso?id=9996](http://www.news.ucdavis.edu/search/news_detail.lasso?id=9996)

Fish

## Water management adaptations to prevent loss of spring-run Chinook salmon in California under climate change

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### Abstract

Spring-run Chinook salmon (*Oncorhynchus tshawytscha*) are particularly vulnerable to climate change because adults over-summer in freshwater streams before spawning in autumn. We examined streamflow and water temperature regimes that could lead to long-term reductions in spring-run Chinook salmon (SRCS) in a California stream and evaluated management adaptations to ameliorate these impacts. We used bias-corrected and spatially downscaled climate data from six General Circulation Models and two emission scenarios for the period 2010 – 2099, as input to two linked models: WEAP to simulate weekly mean streamflow and water temperature in Butte Creek, California that were used as input to SALMOD, a spatially explicit and size/stage structured model of salmon population dynamics in freshwater systems. For all climate scenarios and model combinations, WEAP yielded lower summer base flows and higher water temperatures relative to historical conditions, while SALMOD yielded increased adult summer thermal mortality and population declines. Of management adaptations tested, only ceasing water diversion for power production from the summer holding reach resulted in cooler water temperatures, more adults surviving to spawn, and extended population survival time, albeit with a significant loss of power production. The most important conclusion of this work is that long-term survival of SRCS in Butte Creek is unlikely in the face of climate change and that simple changes to water operations are not likely to dramatically change vulnerability to extinction.

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## Introduction

The literature on aquatic ecosystem services in freshwater systems has converged on three service categories: provisional, regulatory, and cultural (Millennium Ecosystem Assessment 2005). Within the first set of services, the provision of water for consumptive use (e.g., drinking water), non-consumptive use (e.g., hydropower) and aquatic organisms (e.g. fish for food) are typically combined. This combination points out the difficult tradeoffs inherent in the management of freshwater ecosystem services because these services often conflict. In California, for example, service provision rests on a complex and shifting balance of natural and human forces. Climatic variability and watershed response are critical determinants of flow regime and water quality of streams, but these hydrologic signals are dramatically altered by land management decisions and the operation of hydraulic infrastructure (Graf 1999; Yates et al. 2008; Zalewski 2002; Yates et al. 2009).

After decades of such alteration, provisional services related to aquatic organisms in California have experienced marked decline, most acutely for Pacific salmon (Salmonidae). Historical Chinook salmon (*Oncorhynchus tshawytscha*) runs in the Sacramento-San Joaquin (Central Valley) drainage were 1-3 million fish per year (Yoshiyama et al. 1998; 2000), but in recent years runs have usually totaled less than 100,000 fish annually (Lindley et al. 2009). There are myriad reasons why this service may be experiencing such a dramatic decline, but the social importance of salmon runs is revealed by the enormous regulatory and restoration investments being made to arrest their decline (Bernhardt et al. 2005). In 2008 and 2009, prompted by declining runs, the lucrative commercial salmon fishing industry was completely shut down (Pacific Fishery Management Council, [www.pcouncil.org/decisions/archivedecisions.html](http://www.pcouncil.org/decisions/archivedecisions.html)).

Wild Pacific salmon populations in California, Oregon, and Washington are in a long term decline due to factors including overfishing, changes in ocean conditions, water quality and habitat degradation, genetic introgression with hatchery stocks, and impassable barriers to migration (Noakes et al. 2000; Lackey et al. 2006; Moyle et al. 2008). The loss of holding, spawning and rearing habitat in California rivers and streams contributes substantially to the decline in provision of services provided by Chinook salmon (Yoshiyama et al. 2001), largely related to the vast hydraulic manipulation of rivers in the Central Valley. Salmon are currently limited to a small portion of their former range, increasing their vulnerability to climate change. Both young and adult salmon are extremely sensitive to elevated water temperature and associated

increases in energy expenditure that can compromise reproductive performance (Torgersen et al. 1999).

Of particular interest are the few remaining populations of the Central Valley spring-run Chinook salmon (SRCS) evolutionarily significant unit (ESU), a species listed as threatened under both the state and federal endangered species acts. SRCS travel from the ocean to spawning sites during the peak snowmelt period of March, April, hold in coldwater pools during the hot, dry summer months, and spawn in autumn. Historically SRCS were the dominant run in the Central Valley and included eighteen independent populations (Lindley et al. 2007). Presently their distribution is limited to three watersheds with small numbers appearing intermittently in seven other watersheds where access to coldwater pools remains unobstructed. Annual SRCS runs used to number approximately 1 million fish, but they have declined to approximately 16,000 in the Central Valley.

Recently researchers have used downscaled climate data from one or more General Circulation Models (GCMs) to drive a habitat model, with the resulting data passed to a biological model (Battin et al. 2007; Crozier et al. 2008; Isaak et al. 2010; Matulla et al. 2007; Tung et al. 2006; Yates et al. 2008). These models fall primarily into two types of frameworks: those that use bioclimatic envelopes, and those that simulate life history. Bioclimatic models are used to estimate future habitat availability as a function of future climate predictions without specifically modeling life history. Lindley et al. (2007) modeled the potential spatial distribution of Central Valley SRCS under different expectations of the increase in mean August air temperature; they found that some Central Valley SRCS populations disappear with as little as a 2°C increase in mean August air temperature and most populations are extirpated from historic habitat at an increase of 6°C in mean August air temperature (Lindley et al. 2007). A similar model for Idaho mountain streams predicted that rainbow trout (*O. mykiss*) would have an upstream range shift, but not necessarily a loss of total available habitat, while bull trout (*Salvelinus confluentus*) would have an 11-20% range of available habitat contraction (Isaak et al. 2010). Tung et al. (2006) investigated the change in available habitat for a population of *O. masou formosanus*, a landlocked salmon on Taiwan Island. They report that annual average available habitat was reduced for the climate models and thermal criteria tested; available habitat during summer was reduced or eliminated entirely for most modeled scenarios.

Life history models for salmonid resilience relate life history characteristics to climate variables (water temperature, flow) or climate indices such as the Pacific Decadal Oscillation (PDO); for

example, juvenile survival as a function of water temperature or state of the PDO (Battin et al. 2007; Crozier and Zabel 2006; Rand et al. 2006; Zabel et al. 2006). The relationship between climate and life history is then applied to future climate projections to investigate population response to climate change. Matrix models estimate the probability of quasi-extinction (sensu Ginzberg et al. 1982) in populations of SRCS under climate change projections and identify stage specific parameter relationships that might be of interest with respect to climate change (Crozier et al. 2008; Zabel et al. 2006). In a different model framework, Battin et al. (2007) used the spatial population model Shiraz to characterize changes in the physical characteristics of a watershed as function of climate. They explicitly modeled effects of climate change on water temperature and flow and how changes in them affected population dynamics.

These modeling efforts have been consistent in their predictions of negative impacts of climate change on salmonids, including loss of habitat, decreased abundance, and increased risk of extinction. However, they have also called attention to the shortage of analytical frameworks that test the effectiveness of management actions to mitigate for negative effects of climate change (Bryant 2009; Mote et al. 2003; Wilby et al. 2010). In a rare attempt to consider the effectiveness of management responses to climate change, Battin et al. (2007) found that habitat restoration actions, such as changes in land use can partly offset the effects of climate change, but may not be adequate to mitigate these effects entirely. A key point here is that management responses were limited to modifying the hydrologic response of a watershed to changing climate but did not consider opportunities offered by alternative, adaptive operating regimes associated with building new or managing existing hydraulic infrastructure. For example, cold water could be stored in reservoirs for release to reduce water temperatures downstream; this cold water could be transferred to the salmon habitat via canals, forebays, and powerhouses.

Climate change scenarios for California predict warming atmospheric temperatures, reduced snow pack and snow melt runoff, and lower dry season flows (Hayhoe et al. 2004). The hydrologic responses of a watershed to climatic forcing are the result of multiple non-linear physical processes that unfold within a system. These responses can be substantially manipulated by operation of hydraulic infrastructure that is governed by discontinuous conditional rules and agreements. The complex, non-linear nature of these systems makes it extremely difficult to understand the relationship between increasing atmospheric temperature and the future viability of salmon populations. It is even more challenging to determine what management actions might be able to mitigate for climate change effects when human

population growth and other factors are having increased impacts on management of water resources (Cifaldi et al. 2004; Field et al. 1999; Hayhoe et al. 2004). To address this issue, we developed an analytical framework that incorporates 1) climate scenarios, 2) a model of watershed response to climate change, including the capacity to model water management adaptations, and 3) a model of salmon population dynamics (Fig. 1). Here, we use the framework to examine the viability of the SRCS population in Butte Creek under current management and under two relatively simple management changes within the system, across a range of climate predictions.

### **Geographic and Management Settings**

Butte Creek (Fig. 2) is characterized by hydrologic and geomorphic conditions that provide one of the last remaining favorable habitats for SRCS, supplemented by coldwater transfers from the adjacent Feather River. The aquatic ecosystem of Butte Creek is vulnerable to climatic change because the watershed resides at a climatological margin for coldwater species. Its headwaters emanate from lower elevations within the Sierra Nevada where snow accumulation is limited. During the spring, summer, and early fall months, adult SRCS occupy approximately 17 km of holding and spawning habitat (Ward et al. 2004); their habitat in this reach is influenced by operation of the DeSabra-Centerville hydroelectric project operated by Pacific Gas and Electric (PG&E).

Recently the National Marine Fisheries Service issued a Biological Opinion on the Central Valley Water Project that gives numerous directives aimed at salmon recovery (NMFS 2009). While some of the restoration actions recommended may be beneficial for SRCS, there is currently no formal management plan for Butte Creek. Most future management changes for Butte Creek are likely to come from the ongoing Federal Energy Regulatory Commission (FERC) relicensing process for the DeSabra-Centerville hydroelectric project (PG&E 2007). At this point in time proposals include cooling the water in the DeSabra Forebay above the DeSabra Powerhouse and experimenting with different flow regimes through the holding habitat by reducing water diversion at the Centerville Diversion Dam. Other management options include intentionally managing cold water in upstream reservoirs to counteract water temperature increases in critical SRCS holding reaches. These are examples of the type of water management adaptation that can be explored through the application of the proposed analytical framework.

### **Description of Approach**

Climate change does not act on biophysical processes in isolation from infrastructure that redistributes water spatially and temporally. Furthermore, infrastructure may provide management adaptation options. As a consequence, the analysis of management adaptations to climate change impacts on spring-run Chinook salmon in Butte Creek required linking physical, ecological, and water management processes into a single framework (Fig. 1).

### **WEAP Model**

Our framework begins with the Water Evaluation and Planning (WEAP) system to simulate potential changes in streamflow and water temperature in response to climate inputs under a given water management scenario (Null et al. 2010, Purkey et al. 2007; Yates et al. 2005a; Yates et al. 2009; Young et al. 2009). The WEAP hydrologic model uses an empirical, 1-D, 2-store soil moisture accounting scheme to estimate evapotranspiration, surface runoff, and sub-surface flow within a hydrologic unit, or catchment. WEAP also models snow accumulation and melt based on a temperature index formulation. For a full description of the model, the reader is referred to Yates et al. (2005a) and Young et al. (2009) where the algorithms for each hydrologic component are described. WEAP models physical hydrologic processes within a water management context, as opposed to the Variable Infiltration Capacity (VIC) model (Liang 1994), for example, that simulates only hydrology (Maurer and Duffy 2005), and from CALSIM (Water Resources Simulation Model 2000, Sacramento, Calif.) that describes complex operational criteria but requires hydrologic inputs as boundary conditions.

Butte Creek (512 km<sup>2</sup> down to the USGS Chico gage) was divided into catchments with an average spatial resolution of 15 km<sup>2</sup>±15km<sup>2</sup> (Fig. 2) and a water balance calculated on a weekly time step. We used an interpolated weather product with a spatial resolution of 12 km between 1986 and 2005 as climatic boundary conditions (Maurer et al. 2002). Water management was modeled by assigning operating rules to system reservoirs and in-stream flows in accordance with the existing FERC license (PG&E 2007). Hydropower operations logic was based on the 1986-2005 weekly average operations composite developed for the FERC license application (PG&E 2007). We adjusted WEAP's allocation routines in order to capture the observed operation of the DeSabra-Centerville Project.

We used PEST (Doherty 2002) to guide calibration of snow, streamflow and water temperature parameters, minimizing the weighted sum of squared differences between simulated values and field observations. To assess model fit, we used root mean square error (RMSE) and BIAS

previously used to assess WEAP model fit in Sierra watersheds (Young et al. 2009) and added the Nash-Sutcliffe efficiency criteria (E).

For snow accumulation we compared two snow gages (Commission California Data Exchange Center (CDEC) FOR (Four Trees) and HMB (Humbug)) located in the Feather River watershed at 1570 m and at 1981 m elevation to model results at the corresponding elevation bands (i.e. 1500-1750 m and 1750-2000 m). We obtained RMSE of 0.78 and 0.84 m water equivalent, BIAS of -10% and -33%, and E of 0.76 and 0.25 respectively. Modeled snowmelt contributes 15% to total annual streamflow. Consequently, the negative BIAS in snowmelt, when considered in the context of total streamflow volume, represents an error of only -1.5 to -4.4 %, which was considered acceptable.

To calibrate streamflow, we used a split time series approach in which the calibration period was 1996-2005 and the validation period was 1986-1995, focusing calibration statistics on data from June to September, the critical period for species survival. We compared the USGS Butte Creek gauge (USGS 11390000) located at the watershed outlet (a composite of natural and managed hydrology) to simulated streamflow (Fig. 3A). We obtained RMSE of 0.46 and 0.73 m<sup>3</sup>/s, BIAS of -2% and 12%, and E of 0.74 and 0.66 for the calibration and validation periods, respectively.

To assess stream water temperature we used WEAP's internal heat balance equation (Yates et al. 2005b) for stream segments defined by a length and a stage-discharge relationship. The water temperature in each segment is assumed to reach steady state within a time step. In all areas outside the spawning reach, all stream segments were assumed to have a single, representative cross section and flow-stage-width relationship. Within the spawning reach (A1 to E7 in Fig. 2), 40 subreaches were defined by the California Department of Fish and Game (CDFG). We further divided each subreach into a pool, riffle, and run for a total of 120 habitat units. Habitat unit stage-discharge relationships were derived from 14 cross sections and flow-stage-width relationships available from Gard (2003).

To account for water temperature stratification in upstream Philbrook Reservoir on the West Branch Feather River, we integrated a 1-D temperature model within WEAP to solve the one-dimensional heat flux equation (Chapra 1997). The solutions were based on reservoir volume-area-elevation curves, meteorological information, flows in and out of the reservoir, and the vertical location of reservoir outflow. The routine estimates surface layer temperature of the reservoir and the energy available to warm subsurface layers; it updates the previous

temperature profile once the input energy has been diffused. The routine checks for profile stability, and if dense water is overlaying less dense water, convective mixing occurs. Model parameters include: surface radiation absorption, extinction depth, and effective diffusivity. The parameters were adjusted to obtain the best fit to seven available temperature profiles measured in 2004 and 2005.

In catchments higher than 1750 meters above sea level, we assigned a snowmelt water temperature of 0°C. We estimated surface runoff temperature by assuming a linear relationship between runoff temperature and a lagged air temperature, with the slope, intercept and time lag serving as calibration parameters. We assigned a constant temperature to subsurface flows that was used as a calibration parameter. In order to stabilize the numerical routines for the short length scales relative to the time scales, we introduced a length scale multiplier factor that was also used as a calibration parameter. We obtained linear regression coefficients of 4.5 and 4.4, slopes of 0.3 and 0.6 and time lags of 2.4 and 3.4 weeks for the runoff/air temperature relationship in Butte Creek and the West Branch Feather River respectively. We also obtained 17°C as the subsurface temperature and a reach length factor of 3.7 with 95% confidence interval of 3.05-4.42. With this calibration, we obtained a reasonable upstream-downstream water temperature profile in the habitat reach (Fig. 3B) as compared to observations with a RMSE range of 0.09 to 0.14 °C, BIAS range of -0.02 to -0.10 and an E range of 0.36 to 0.49.

WEAP outputs weekly mean water flow and weekly mean water temperature to a csv file which is modified manually in Excel into the format required by the salmon population dynamics model, then used as an input data file for that model.

### **SALMOD Fish Population Dynamics Model**

Our framework continues with SALMOD - a population dynamics model which simulates the freshwater life stages of the salmonid life cycle including threshold effects on survival in response to environmental conditions (Bartholow 1996). It is deterministic, spatially explicit, operates on a weekly timestep, and relates stage-based demographic parameters (e.g., growth and mortality) and biological processes (e.g., migration and spawning) to habitat units and climatic variables (e.g., water temperature and flow) (Bartholow et al. 1993). For a full description of the model, see Bartholow et al. (2002). We chose SALMOD because it has been used in other California watersheds (Bartholow 2004, Bartholow and Heasley 2006, Campbell et al. 2010), making it familiar to local water managers. In addition, SALMOD's basic features include the ability to model SRCS distribution across the 120 habitat units, which was important

because in most years SRCS were concentrated in the upstream habitat units. SALMOD's ability to model multiple life stages was also important, because we wanted to investigate adult over-summering mortality, egg mortality (in vivo and in situ), and juvenile mortality, and we did not have an a priori way to determine the life stage that would be most affected by climate change. Additionally, starting off with a framework designed for the complete freshwater life history allows for future research to include other life history stages in a relatively seamless manner.

SALMOD requires an input file with parameters for each age class of salmon. For example, for adult salmon this includes a water temperature-mortality relationship, base mortality, density-related mortality and movement, length:weight regression, weight:fecundity regression, sex ratio, spawning habitat capacity, and water temperature-based timing of spawning. Parameter estimates were obtained from agency reports, primary literature, and books, and previous SALMOD implementations. We included parameters for all age classes in SALMOD in model calibration, but because of the strong influence of adult summer mortality on population persistence, model results were largely insensitive to parameters for other age classes.

Preliminary model runs indicated that in many instances few adult SRCS survived the over-summering period in order to spawn, making conditions for in situ egg survival and juvenile survival less relevant, and indicating that the temperature-mortality relationship for over-summering adults was critical to our SALMOD calibration. We estimated a relationship based on field data specific to Butte Creek SRCS. Eight years (2001-2008) of overlapping data from pre-spawn carcass surveys, summer snorkel surveys, spawner abundance estimates, and water temperature data from 6 of the 40 CDFG reaches were used (Garman and McReynolds 2009; Ward et al. 2004; California Department of Fish and Game, unpublished data). Rather than applying a constant temperature across all intermediate habitat units (stream segments) as has been done in some previous SALMOD implementations, a linear interpolation was performed so that temperature would gradually change between points of known temperature. Fish were spatially distributed in SALMOD each calibration year according to the estimated spatial distribution from the annual snorkel survey. The total number of fish in the system each year was based on estimated number of spawners, and pre-spawn mortality for that particular year. The water temperature-mortality relationship for summer holding adults was described by a logistic function, similar in its final form to that used by Baker et al. (1995). The logistic function was chosen because it is a natural model for dose-response relationships, such as temperature and mortality rate, where weekly mortality rate is bounded by 0 and 1. The relationship was



calculated within SALMOD using the PEST PAR2PAR routine (Doherty 2002) and was achieved by minimizing the sum of squared error between annual modeled mortality versus annual observed mortality. The resulting temperature-mortality relationship (Fig. 4A) had parameter estimates (95% confidence intervals)  $\alpha = 115.08$  (100.178, 129.982) and  $\beta = -5.421$  (-5.99, -4.86), respectively. The most sensitive range of weekly mean temperature lies between 20°C and 22°C, which is consistent with values found in the literature (see review in McCullough 1999). However, it should be noted that this temperature-mortality relationship may be specific to Butte Creek SRCS, since it implicitly incorporates the effects of Butte Creek-specific water flow (including the instream flow requirement above the Centerville Powerhouse), the weighted usable area of each habitat unit, the spatial distribution of the SRCS in the years for which historical data were available, and any disease-related mortality that may have occurred.

We could have calibrated SALMOD using either mean or maximum weekly water temperature. We chose to use the mean because we were concerned that prolonged warm periods would stress fish and increase their metabolic rates (and in the case of juveniles, food requirements). A few hot days followed by cool nights may have been less likely to cause mortality than a sustained period with days almost as hot, but followed by warm nights. It was also not clear whether the weekly mean, weekly mean of daily maximums, or the weekly maximum would be the most appropriate metric to use, because each potentially could play a role.

We calibrated SALMOD to annual estimates of adult pre-spawn mortality from pre-spawn carcass surveys. We attempted to calibrate SALMOD using two different habitat data sources: 1) observed water flow and observed water temperature, and 2) modeled water flow and observed water temperature generated by WEAP for the five years when historical climate forcing data overlapped the eight years of ecosystem observation data (2001-2005). During the summer months water flow varied little in the upstream half of the SRCS holding area, due to the minimum flow requirement of 1.13 m<sup>3</sup>/s that applies during this period between DeSabra Powerhouse and Centerville Powerhouse, where the majority of SRCS hold. As a result, water temperature dominated the SRCS pre-spawn mortality calibration. The modeled water temperature captured the overall structure of the historical temperature data well, and the modeled data displayed reasonable accuracy and bias across the summer season, as well as across years. However, modeled water temperature differed from observed by  $\pm 2^\circ\text{C}$  in a few key weeks (week 27 of 2001, and week 29 of 2003) reducing the SALMOD performance in simulating adult pre-spawn mortality. For comparison, we present the observed salmon mortality

and the simulated salmon mortality 1) using observed flow and water temperature data and 2) using modeled flow and water temperature data (Fig. 4B).

SALMOD clearly performs better when observed environmental data, rather than when data modeled using WEAP, are used to guide the calibration. To evaluate model fit, a linear regression of model output (X) on observation data (Y) of the form  $Y = A + BX$  was created. The coefficient of determination, or  $R^2$ , had a value of 0.9252 for the observed historical climate data, but  $R^2 = 0.0017$  for the WEAP-generated historical data. The regression estimates for A and B would equal 0 and 1 respectively if model predictions perfectly matched observations. When this is not the case, differences between model output and observed data are due to unexplained variance rather than to a systematic bias or inconsistency (Pineiro et al. 2008). Use of observed environmental data yielded P-values for the tests for intercept and coefficient of 0.338 and 0.21 respectively, suggesting that SALMOD provides an adequate prediction of adult salmon summer mortality based on observed spawner abundance and spatial distribution, water temperature and flow. We opted to calibrate SALMOD based on observed water flow and water temperature data, and, by necessity, to use model output as the unknown environmental conditions under future climate scenarios. This gave us a salmon model that is calibrated to have the best possible fit to historical conditions.

Given the errors inherent in the WEAP calibration, we acknowledge that a number of factors may reduce the accuracy of our predictions. (1) In any particular year of the future scenarios, modeled water temperatures may not be perfectly accurate, so the salmon survival may be under or overestimated. (2) Climate scenarios currently available may not accurately reflect future climate, particularly if emissions continue to exceed those in any of the available scenarios. (3) Over the 90-year timeframe of our predictions, other factors not included in this modeling exercise, such as ocean conditions, may have large climate-related impacts on adult salmon survival before their return to freshwater to spawn. Nevertheless, modeled long-term trends in salmon survival should be representative, as should the effects of management actions undertaken to decrease temperatures given WEAP's ability to accurately capture broader trends in water temperature. This is because the key aim of our research was to identify environmental tipping points beyond which salmon could go extinct, not the exact year in which this would occur.

To model effects of future climate and management actions on the summer survival of adult SRCS we used the parameter set from the SALMOD calibration based on observed

environmental data. Because SALMOD does not include an ocean habitat component to calculate the number of returning adults for a given cohort, we seeded the system each year with 15,000 holding adults, the approximate annual spawner abundance in the last decade. It should be stressed that this accommodation likely causes our results to over-predict the time that salmon will persist. Also in the historical dataset the initial spatial distribution of adult salmon along the creek is quite variable from year to year. We have no way to know what initial distribution would occur in the future. Therefore we used the mean initial spatial distribution from the eight years of historical data (2001-2008) as the initial distribution in all future scenarios.

### **Implementation of Analytical Framework for Future Climate Scenarios and Management Adaptations**

Our experimental design relied upon identification of a set of GCMs run under a pair of emission scenarios that would allow for estimation of the uncertain fate of SRCS in the system. While this approach is not sufficient to characterize the probability of any potential future state of the system, it provides a first estimation of system vulnerability to progressive climate change while considering possible changes in the hydrologic regime (e.g., change time and duration of dry periods) over the course of the entire 21<sup>st</sup> century. We used multiple GCMs and emissions scenarios because we had no *a priori* method to know how variable their predictions would be for the Butte Creek watershed, nor which would be most accurate. Our intention is to show that the group of models and scenarios we used provide a reasonable “predictive envelope” of the future climate.

We used 6 GCMs (cnrmcm3, gfdlcm21, microc32med, mpiecham5, ncarccsm3 and ncarpcm1) that have been selected for California’s 2008 Climate Change Impact Assessment (<http://meteora.ucsd.edu/cap/scen08.html>) and two emission scenarios, A2 and B1 (IPCC 2007), for the analysis. Downscaling to the Butte Creek system was accomplished using the bias correction and spatially downscaling method (Maurer and Hidalgo 2008) which generated continuous daily fields of key climate variables on a 12 km x 12 km grid scale over the system. This method uses statistical transformations to match observed climate data to outputs from GCMs during the historical period that are then applied to future climate projections. These daily values were converted to weekly averages for use in WEAP. There is a general consensus among models that conditions in Butte Creek will become drier and hotter over the course of the 21<sup>st</sup> century with obvious negative implications for SRSC in the system (Cayan et al. 2008).

In order to assess the vulnerability of the system under these potential climate futures, the Butte Creek WEAP application was first run assuming that current management arrangements remain in place. Having established baseline vulnerability, three simple management adaptations were considered: (i) eliminate the diversion of water from Butte Creek at the Centerville diversion dam during the critical July-September holding period, with all flow in the creek released into the SRCS summer holding reaches, (ii) release water from Philbrook Reservoir from the warm top layer prior to week 30 (July 23-29) and after week 40 (October 1-7) while releasing from the cooler bottom of the reservoir between these dates (in actuality releases are currently possible only from the bottom of the reservoir); and (iii) combine adaptations 1 and 2. Options 1 and 3 result in loss of power generation from Centerville Powerhouse. Neither current nor upcoming climatic conditions nor the actual water temperature conditions in critical reaches of Butte Creek were used to condition these management actions.

These changes in operations (adaptations) are being considered as part of ongoing FERC relicensing of the DeSabra-Centerville Project, based on recognition that even under historical climatic and hydrologic conditions, SRCS in Butte Creek are vulnerable to water temperature conditions in excess of critical thresholds during the summer holding period. One potential advantage of the current analysis is the focus on understanding how these adaptations may perform under future climatic and hydrologic regimes that depart from conditions observed in the recent historical past.

### **Climate Scenario Analysis**

Weekly mean precipitation, air temperature and wind speed for the twelve GCM-emission scenario combinations for the 2009-2099 period were used in the WEAP model. Streamflow predictions were made for June, July and August (JJA) and December, January and February (DJF) for three periods (2009-2034, 2035-2069, and 2070-2099). These predictions indicate that, although some scenarios may have greater streamflow in the winter, all scenarios have a 20-50% reduction in summer streamflow (black bar in Fig. 5A) for the 2070-2099 period relative to historical averages. Summer water temperatures are predicted to increase 2-5°C for the 2070-2099 period, relative to historical averages (Fig. 5B). This range of variability in the results highlights the inherent uncertainty of this sort of analysis and the need to evaluate a range of plausible future conditions.

To observe the spatial effect of these climate scenarios throughout the spawning reach we plotted the aggregated water temperature distribution of all six A2 scenarios and all six B1

scenarios for pools A1, C5, C7 and E7 and compared them to the historic modeled temperature distribution (Fig. 6). These box plots represent the range of uncertainty. The results indicate a consistent increase in temperature in all pools for the analyzed climate scenarios. The increase in the median rises linearly from 1.42 to 2.33°C from pools A1 to C7 for A2 scenarios and from 1.04 to 1.65°C for B2 scenarios.

We defined SRCS extinction as four consecutive years of zero pre-spawn survival of adult salmon. Since most Butte Creek SRCS spawn at three and four years of age (McReynolds et al. 2007), after four years in which no adults survive to spawn there would be no fish alive to return from the ocean to reproduce. We reiterate that this survival rate is based on an initial seeding of 15,000 adult salmon each year, because of the inability of SALMOD to estimate the number of returning adults for a given cohort. This prevented us from allowing population declines to accumulate over years, suggesting the population extinction is likely to occur before there are four consecutive years of simulated zero pre-spawn survival. For three of the six B1 scenarios salmon were able to survive the full 90-year simulation without meeting the extinction criterion, whereas none of the A2 scenarios saw salmon survive for the full 90-year simulation. The shortest time to extinction was 49 years and occurred for the A2 cnrmcm3 model-scenario combination. There is a distinct difference between the extinction times predicted by the A2 and B1 emission scenarios, averaging 63.5 and 84 years respectively (Fig. 7).

There is considerable variation and uncertainty among predictions for the twelve GCM-emission scenario combinations in terms of the proportion of adult salmon that survived the freshwater summer holding period and spawned each year, ranging from years where most fish survived the summer to years where no fish survived (Fig. 7). Over the full 90-year simulation the average proportion of fish that survived to spawn each year was similar for the A2 and B1 emission scenarios, 0.29 and 0.39, respectively. When counting only years in which there were surviving fish, these values increase to 0.43 and 0.46, respectively.

### **Management Adaptation Analysis**

To observe the spatial effect of the management adaptations throughout the spawning reach, we plotted the aggregated water temperature distribution of all twelve GCM-climate scenario combinations for each management adaptation for pools A1, C5, C7 and E7 and compared them to the aggregated temperature distribution of all climate scenarios for business-as-usual (baseline) management (Fig. 8). The temperature distribution is a range that represents the uncertainty of all twelve GCM-emission scenario combinations. The results indicate slight

decreases of  $<0.01^{\circ}\text{C}$  in water temperature for all quartiles of all management adaptations in pools C7 and E7. Management adaptation 1 and management adaptation 3 indicate a reduction in the median temperature in pool A1 of  $0.2\text{--}0.3^{\circ}\text{C}$  and a reduction in the median temperature in pool C5 of  $0.8\text{--}1^{\circ}\text{C}$ .

Across the twelve GCM-emission scenario combinations, management adaptation 1 increased the estimated time to extinction of salmon by zero to 17 years over the respective baseline values (Fig. 9). The mean increase in time was 4.75 years (for all comparisons we considered all twelve model-climate scenario combinations, including those where salmon survived to 2099). Management adaptation 2 was not effective for any of the twelve model-climate scenario combinations and in fact in some cases made extinction occur sooner. The range of changes in extinction time was zero to six years sooner. The average change in extinction time was 0.58 years sooner. For management adaptation 3 the range of changes to extinction time are from one year sooner to 17 years later. The mean change in extinction time was 3.4 years later. The effects of management adaptations 1 and 2 appear to be cumulative in management adaptation 3, with any net benefit being caused by management adaptation 1. Management adaptation 2 appears to be counter-productive.

The management adaptations changed the proportion of adult salmon that survived to spawn each year over the duration of the simulation (Fig. 10). For management adaptation 1, there was a mean increase of 0.52 (range: 0.32 to 0.64), with emission scenarios A2 and B1 having similar mean values of 0.51 and 0.52, respectively. As was the case for extinction time, management adaptation 2 was ineffective in improving survival of fish. It had a mean proportional decrease of 0.08 (range: -0.04 to -0.12), with emission scenarios A2 and B1 having similar values of 0.08 each. Management adaptation 3 had a mean proportional increase of 0.42 surviving fish (range: 0.30-0.53). The A2 and B1 scenarios had similar mean values of 0.41 and 0.43, respectively.

### **Uncertainty in the Analyses**

Each of the components in the analytical framework contributes unique errors and uncertainties which have implications for our results. This raises the issue of how best to represent uncertain future climate conditions in the framework. Key sources of uncertainty at this stage of the analysis are model inputs and parameter choices (Van Asselt and Rotman 2002). We worked from the premise that a method is useful if it produces a plausible set of expectations about

what is an inherently uncertain future and is also appropriate to the question at hand. This was the standard used to select a set of climate projections used to derive insights on the possible trajectory of SRCS in Butte Creek.

Uncertainty in precipitation and air temperature input data obtained from GCMs and emission scenarios translates into greater uncertainty in the climate and management predictions we generate. Given the wide variability of possible future scenarios, our approach to incorporating this uncertainty in our analysis was to run multiple GCMs and two emission scenarios, in order to generate a comprehensive ensemble of potential future climates. By selecting this approach, our future projections provide a range of possible responses of the system to climate and to potential management adaptations.

The set of parameters used to calibrate models for historic conditions have ranges of uncertainty provided by the confidence intervals found during calibration. These parameters may change in the future; however it is not possible to know how they will change, and consequently, using them for estimates of future fish abundance adds additional uncertainty to the predictions.

In the future, the spatial distribution of adult SRCS along Butte Creek may differ from past observations. We explored how sensitive the model results are to uncertainty in this distribution. Using the most extreme GCM-climate scenario combination (A2 cnrmcm3), we bootstrapped from our known spatial distributions to create twenty different fish distributions. After inspection of the output, it appeared that only three of the twenty scenarios resulted in extinction at the same time as the initial simulation, while in the rest the salmon made it to the end of the 90-year simulation. However, if the threshold criterion for determining extinction is increased from four consecutive years of zero surviving fish to four consecutive years of twenty or fewer fish, all twenty bootstrapped scenarios are consistent in that extinction occurs at the same time as in the initial simulation. A re-inspection of the initial scenario showed that the same extinction time is predicted by a minimum threshold population size of twenty fish as when the threshold is at zero fish for all twelve GCM-climate scenario combinations. This result indicates that model performance is relatively robust with respect to the spatial distribution used. Furthermore, the most upstream habitat unit will always be the coldest, so, assuming that some SRCS will always hold in this habitat unit, the year of extinction for a given model run will ultimately depend on water temperature in this unit. The spatial distribution of fish in other habitat units, and the temperature gradient along the creek, will affect the abundance trend over years of the

simulation, but when no SRCS adults can survive the summer in the upstream habitat unit, all SRCS adults in all other units would also not survive.

Ecosystem modeling must make simplifications relative to the complexity of the real world. Our models were simplified by the exclusion of processes such as hyporheic flow, potential pool stratification, changes in channel morphology or land use, ocean conditions, fish disease dynamics, and metapopulation dynamics between Butte Creek and other SRCS watersheds. However, because these factors would have both positive and negative effects on abundance, we made the assumption that any resulting errors would cancel each other out. Excluding some relevant processes from the analytical framework increases uncertainty in model predictions, although we suspect changes in fact would be small. The analytical framework may be improved by adding one or more of these influences, but at the cost of increased complexity and reduced comprehension of results.

## Discussion

We have assembled an analytical framework linking climate data, a watershed hydrology model, water management, and salmon population dynamics, and applied it to SRCS in Butte Creek. Given the availability of historical data we were able to calibrate the WEAP and SALMOD models to fit historical records of flow, water temperature and over-summer adult salmon mortality for the watershed. We used this framework to predict outcomes of current water management on SRCS populations, as well as management under future climate change and management adaptation. The analytical framework offers a clear advantage over previous work, in that it allows explicit modeling of specific water management options as a response to flow and water temperature requirements of salmon.

The management options we investigated all come to the basic conclusion that a dramatic change in the system will take place in the second half of the 21<sup>st</sup> century. Only halting all diversions from the creek during the critical July-September holding period has potential for delaying the year when the system tips past a critical threshold for SRCS, but at the expense of a great deal of hydropower generation. Particularly vexing is the implication that changing management of the upstream reservoir has little positive impact. This raises another set of questions about whether it is prudent, from a policy perspective, to continue efforts to define management regimes to maintain SRCS in Butte Creek. A closer look suggest that while there would certainly be ample justification for refining SRCS restoration plans that consider the large



meta-population in the Central Valley, there is also reason to consider more aggressive and refined management regimes within Butte Creek itself.

Consider, for example, the potential management of the cold water pool in Philbrook Reservoir. Analysis of the simulated water temperature profiles suggest that rather than producing a system with an enhanced cold water pool, the release of water from near the top of the reservoir outside the critical summer period actually degraded thermal stratification of the reservoir. This was likely associated with a generally thinning of the upper warm layer allowing for deeper penetration of incoming solar energy. While Philbrook Reservoir is likely not large enough to support this sort of operation while maintaining stratification, it is worth noting that the management strategy modeled was relatively rigid in that the change in operations was set at a specific week and not based on downstream water temperature estimates. Rules designed to make more judicious use of the cold water resource when conditions in the over-summer holding reach were actually approaching critical water temperatures could potentially be adjusted relative to the thermal characteristics of Philbrook Reservoir in order to improve system viability. Evaluating more aggressive and refined adaptation strategies will be the focus of future modeling work conducted using our analytical framework. They represent the kinds of water management adaptation strategies that will be required to protect vulnerable aquatic ecosystems throughout California.

Climate change may affect meta-population processes in ways that will be important to salmon dynamics (Schindler et al. 2008). Given the vulnerable nature of SRCS in Butte Creek, this may be particularly important for the sustainability of SRCS in California's Central Valley. Historically the Central Valley SRCS ESU was comprised of 18 independent populations, but it has only three independent populations remaining (Lindley et al. 2007). While our project focused on Butte Creek SRCS, it is likely that management adaptations that sustain Butte Creek SRCS will not be adequate to ensure the survival of the ESU. Reintroduction of salmon above impassable dams (potentially through trap and truck operations) has been recommended (NMFS 2009) in order to allow salmon to reach cooler water at higher elevations and to increase the number of watersheds occupied by SRCS. Watersheds in the southern half of the Sierra Nevada are predicted to retain more snow pack (and thus more summer baseflow) than those in the northern half (Maurer et al. 2007) so re-introducing SRCS to southern watersheds may be a particularly effective method to distribute the risk of extinction. Indeed, SRCS reintroductions have been recommended above the lowest dam on the Stanislaus River, and in the San Joaquin River below Friant Dam (NMFS 2009). However, it is not known whether future climate

scenarios will provide adequate conditions for SRCS in other watersheds, nor whether water management adaptations exist in these watersheds to mitigate climate change impacts. The framework we have developed in this paper could be applied to other SRCS watersheds and could form the basis for metapopulation-scale salmon management in order to balance human water needs with habitat requirements of salmon.

## **Conclusions**

The most important conclusion of this work is that the long-term survival of SRCS in Butte Creek is questionable in the face of climate change and that simple changes to water operations are not likely to dramatically change vulnerability to extinction. Specifically, the analysis reveals that it is plausible to expect that the system will tip past critical thresholds some time during the second half of the 21<sup>st</sup> Century. For the managers of SRCS in Butte Creek, and in the wider Central Valley, this conclusion poses significant challenges that require an ecosystem protection strategy that moves well beyond incremental changes in management of SRCS. It is likely that Butte Creek SRCS is not the only resource facing such a challenge.

This highlights the second important conclusion, that water management adaptations may extend the survival of threatened salmon populations on the time scale of decades. Linked analytical frameworks such as the one presented here can guide adaptation of water management regimes to protect important ecosystem services. Furthermore, our results imply that management options available with current infrastructure need to be fine tuned to obtain the maximum benefit from power production while significantly reducing SRCS vulnerability to extinction. Without such changes in water management, SRCS are likely to go extinct in Butte Creek and elsewhere in California.

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## References

- Baker, P. F., Speed, T. P., and Ligon, F. K. (1995). "Estimating the influence of temperature on the survival of chinook salmon smolts (*Oncorhynchus tshawytscha*) migrating through the Sacramento - San Joaquin River Delta of California." *Can. J. Fish. Aquat. Sci.*, 52:855-863.
- Bartholow, J. M., Laake, J. L., Stalnaker, C. B. a., and Williamson, S. (1993). "A salmonid population model with emphasis on habitat limitations." *Rivers*, 4(4), 265-279.
- Bartholow, J. M. (1996). "Sensitivity of a salmon population model to alternative formulations and initial conditions." *Ecol. Model.*, 88(1-3), 215-226.
- Bartholow, J., Heasley, J., J. Laake, J. Sandelin, B.A.K. Coughlan, and A. Moos. 2002. SALMOD: a population model for salmonids: user's manual. Version W3. . Fort Collins, CO: U.S. Geological Survey. 76 p.
- Bartholow, J. (2004). "Modeling Chinook salmon with SALMOD on the Sacramento River, California." *Hydroécol. Appl.*, 14(1), 193-219.
- Bartholow, J., and Heasley, J. (2006). *Evaluation of Shasta Dam scenarios using a salmon Production Model*. USGS Administrative Report, Fort Collins, CO.
- Battin, J., Wiley, M. W., Ruckelshaus, M. H., Palmer, R. N., Korb, E., Bartz, K. K., and Imaki, H. (2007). "Projected impacts of climate change on salmon habitat restoration." *Proc. Nat. Acad. Sci.*, 104(16), 6720-6725.
- Bernhardt, E. S., Palmer, M. A., Allan, J. D., Alexander, G., Barnas, K., Brooks, S., Carr, J., Clayton, S., Dahm, C., Follstad-Shah, J., Galat, D., Gloss, S., Goodwin, P., Hart, D., Hassett, B., Jenkinson, R., Katz, S., Kondolf, G. M., Lake, P. S., Lave, R., Meyer, J. L., O'Donnell, T. K., Pagano, L., Powell, B., and Sudduth, E. (2005). "Ecology - Synthesizing US river restoration efforts." *Science*, 308(5722), 636-637.
- Bryant, M. D. (2009). "Global climate change and potential effects of Pacific salmonids in freshwater ecosystems of southeast Alaska." *Clim. Change*, 95, 169-193.
- Campbell, S. G., Bartholow, J., and Heasley, J. (2010). *Application of the Systems Impact Assessment Model (SIAM) to fishery resource issues in the Klamath River, California*. USGS Open-File Report.
- Cayan, D. R., Maurer, E. P., Dettinger, M. D., Tyree, M. and Hayhoe, K. (2008). "Climate change scenarios for the California region." *Clim. Change*, 87, Suppl. 1, 21-42, doi: 10.1007/s10584-007-9377-6.
- Chapra, S. (1997). *Surface Water-Quality Modeling*, McGraw-Hill, New York.

- Cifaldi, R. L., Allan, J. D., Duh, J. D., and Brown, D. G. (2004). "Spatial patterns in land cover of exurbanizing watersheds in southeastern Michigan." *Landscape Urban Plan.*, 66(2), 107-123.
- Crozier, L., and Zabel, R. W. (2006). "Climate impacts at multiple scales: evidence for differential population responses in juvenile Chinook salmon." *J. Animal Ecol.*, 75(5), 1100-1109.
- Crozier, L. G., Zabel, R. W., and Hamlet, A. F. (2008). "Predicting differential effects of climate change at the population level with life-cycle models of spring Chinook salmon." *Glob. Change Biol.*, 14(2), 236-249.
- Doherty, J. (2002). *Model independent parameter estimation (PEST) user's manual, 5th Ed.* Watermark Numerical Computing, Bethesda, MD.
- Field, C. B., Daily, G. C., Davis, F. W., Gaines, S., Matson, P. A., Melack, J. a., and Miller, N. L. (1999). *Confronting climate change in California*. The Union of Concerned Scientists and the Ecological Society of America.
- Gard, M. (2003). *Flow-habitat Relationships for Spring-Run Chinook Salmon Spawning in Butte Creek*. U.S. Fish and Wildlife Service, Sacramento, CA.
- Garman, C., and McReynolds, T. 2009. *Butte and Big Chico Creeks spring-run Chinook Salmon, *Oncorhynchus tshawytscha* life history investigation 2007-2008*. California Department of Fish and Game, Inland Fisheries Division, North Central Region.
- Ginzburg, L. R., Slobodkin, L. B., Johnson, K. & Bindman, A. G. (1982). "Quasiextinction probabilities as a measure of impact on population growth." *Risk Anal.* 2: 171-181.
- Graf, W. (1999). "Dam nation: A geographic census of American dams and their large-scale hydrologic impacts." *Water Resour. Res.*, 35, 1305-1311.
- Hayhoe, K., Cayan, D., Field, C. B., Frumhoff, P. C., Maurer, E. P., Miller, N. L., Moser, S. C., Schneider, S. H., Cahill, K. N., Cleland, E. E., Dale, L., Drapek, R., Hanemann, R. M., Kalkstein, L. S., Lenihan, J., Lunch, C. K., Neilson, R. P., Sheridan, S. C., and Verville, J. H. (2004). "Emissions pathways, climate change, and impacts on California." *Proc. Nat. Acad. Sci.*, 101(34), 12422-12427.
- IPCC (Intergovernmental Panel on Climate Change). (2007). *Climate change 2007: synthesis report*. IPCC, Geneva, Switzerland. 104 p.,  
[http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm)
- Isaak, D. J., Luce, C. H., Rieman, B. E., Nagel, D. E., Peterson, E. E., Horan, D. L., Parkes, S., and Chandler, G. L. (2010). "Effects of climate change and wildfire on stream

- temperatures and salmonid thermal habitat in a mountain river network." *Ecol. Appl.*, 20(5), 1350-1371.
- Lackey, R. T., Lach, D. H., and Duncan, S. L. eds. (2006). *Salmon 2100: the future of wild Pacific salmon*. American Fisheries Society, Bethesda, MD.
- Liang, X., Lettenmaier, D. P., Wood, E. F., and Burges, S. J. (1994). "A simple hydrologically based model of land surface water and energy fluxes for GSMs." *J. Geophys. Res.*, 99(D7), 14,415-14,428.
- Lindley, S. T., Schick, R. S., Mora, E., Adams, P. B., Anderson, J. J., Greene, S., Hanson, C., May, B. P., McEwan, D. R., MacFarlane, R. B., Swanson, C., and Williams, J. G. (2007). "Framework for assessing viability of threatened and endangered Chinook salmon and steelhead in the Sacramento-San Joaquin basin." *San Francisco Estuary and Watershed Science*, 5(1. Art 4), 1-26.
- Lindley, S. T., Grimes, C. B., Mohr, M. S., Peterson, W., Stein, J., Anderson, J. T., Botsford, L. W., Bottom, D. L., Busack, C. A., Collier, T. K., Ferguson, J., Garza, J. C., Grover, A. M., Hankin, D. G., Kope, R. G., Lawson, P. W., Low, A., MacFarlane, R. B., Moore, K., Palmer-Zwahlen, M., Schwing, F. B., Smith, J., Tracy, C., Webb, R., Wells, B. K., Williams, T. H. (2009). *What caused the Sacramento River fall Chinook stock collapse?* Pre-publication report to the Pacific Fishery Management Council. March 18, 2009. 57 p.
- Matulla, C., Schmutz, S., Melcher, A., Gerersdorfer, T., and Haas, P. (2007). "Assessing the impact of a downscaled climate change simulation on the fish fauna in an Inner-Alpine River." *Int. J. of Biometeorol.*, 52(2), 127-137.
- Maurer, E. P., and Duffy, P. B. (2005). "Uncertainty in projections of streamflow changes due to climate change in California." *Geophys. Res. Lett.*, 32(3), L03704.
- Maurer, E. P., Stewart, I. T., Bonfils, C., Duffy, P. B., and Cayan, D. (2007). "Detection, attribution, and sensitivity of trends toward earlier streamflow in the Sierra Nevada." *J. Geophys. Res.-Atmos.*, 112, D11118, 1-12.
- Maurer, E. P., and Hidalgo, H. G. (2008). "Utility of daily vs. monthly large-scale climate data: an intercomparison of two statistical downscaling methods." *Hydrol. Earth Syst. Sc.*, 12(2), 551-563.
- Maurer, E. P., Wood, A. W., Adam, J. C., Lettenmaier, D. P., and Nijssen, B. (2002). "A long-term hydrologically based dataset of land surface fluxes and states for the conterminous United States." *J. Climate*, 15(22), 3237-3251.
- McCullough, D. A. (1999). "A review and synthesis of effects of alterations to the water temperature regime on freshwater life stages of salmonids, with special reference to

- Chinook salmon." US Environmental Protection Agency. EPA 910-R-99-010, Region 10, Seattle, Washington.
- McReynolds, T. R., Garman, C. E., Ward, P. D., and Plemons, S. L. (2007). "Butte and Big Chico Creek spring-run Chinook salmon, *Oncorhynchus tshawytscha* life history investigation 2005-2006." Administrative Report No. 2007-2, Inland Fishes, California Department of Fish and Game. 37 p.
- Millennium Ecosystem Assessment (2005). *Ecosystems and human well-being: Wetlands and water, synthesis*. World Resources Institute, Washington, D.C.,  
<http://www.millenniumassessment.org/documents/document.358.aspx.pdf>.
- Mote, P. W., Parson, E., Hamlet, A. F., Keeton, W. S., Lettenmaier, D., Mantua, N., Miles, E. L., Peterson, D., Peterson, D. L., Slaughter, R., and Snover, A. K. (2003). "Preparing for climatic change: The water, salmon, and forests of the Pacific Northwest." *Clim. Change*, 61(1-2), 45-88.
- Moyle, P. B., Israel, J. A., and Purdy, S. A. (2008). *Salmon, steelhead, and trout in California: Status of an emblematic fauna*. Report commissioned by California Trout, 316 p.,  
<http://www.caltrout.org/SOS-Californias-Native-Fish-Crisis-Final-Report.pdf>
- National Marine Fisheries Service (NMFS). (2009). *Biological opinion and conference opinion on the long-term operations of the Central Valley Project and State Water Project*. National Marine Fisheries Service. Southwest Region. June 4, 2009. 844 p.
- Noakes, D; Beamish, R; and Kent, M. (2000). "On the decline of Pacific salmon and speculative links to salmon farming in British Columbia." *Aquaculture*, 183(3-4), 363-386.
- Null, S. E., Viers, J. H., and Mount, J. F. (2010). "Hydrologic response and watershed sensitivity to climate warming in California's Sierra Nevada." *Plos One*, 5(3).
- Pacific Gas and Electric Company (PG&E). (2007). *License Application - DeSabra-Centerville Project: FERC Project No. 803. License Application, Volume I: Executive Summary, Initial Statement and Exhibits A, B, C, D, F, G and H*. Pacific Gas and Electric Company.
- Pineiro, G., Perelman, S., Guerschman, J. P., and Paruelo, J. M. (2008). "How to evaluate models: Observed vs. predicted or predicted vs. observed?" *Ecol. Model.*, 16(3-4), 316-322.
- Purkey, D. R., Huber-Lee, A., Yates, D. N., Hanemann, M., and Herrod-Julius, S. (2007). "Integrating a climate change assessment tool into stakeholder-driven water management decision-making processes in California." *Water Resour. Manag.*, 21(1), 315-329.

- Rand, P. S., Hinch, S. G., Morrison, J., Foreman, M. G. G., MacNutt, M. J., Macdonald, J. S., Healey, M. C., Farrell, A. P., and Higgs, D. A. (2006). "Effects of river discharge, temperature, and future climates on energetics and mortality of adult migrating Fraser River sockeye salmon." *Trans. Am. Fish. Soc.*, 135(3), 655-667.
- Schindler, D. E., Augerot, X., Fleishman, E., Mantua, N. J., Riddell, B., Ruckelshaus, M., Seeb, J., and Webster, M. (2008). "Climate change, ecosystem impacts, and management for Pacific salmon." *Fisheries*, 33(10), 502-506.
- Torgersen, C. E., Price, D. M., Li, H. W., and McIntosh, B. A. (1999). "Multiscale thermal refugia and stream habitat associations of Chinook salmon in northeastern Oregon." *Ecol. Appl.*, 9(1), 301-319.
- Tung, C. P., Lee, T. Y., and Yang, Y. C. (2006). "Modelling climate-change impacts on stream temperature of Formosan landlocked salmon habitat." *Hydrol. Process.*, 20(7), 1629-1649.
- Van Asselt, M. B. A., and Rotman, J. (2002). "Uncertainty in integrated assessment modeling: from positivism to pluralism." *Clim. Change*, 54, 75-105.
- Ward, P., McReynolds, T., and Garman, C. (2004). *Butte Creek Spring-Run Chinook Salmon, Oncorhynchus tshawytscha, Pre-Spawn Mortality Evaluation*. California Department of Fish and Game, Sacramento Valley - Central Sierra Region.
- Wilby, R. L., Orr, H., Watts, G., Battarbee, R. W., Berry, P. M., Chadd, R., Dugdale, S. J., Dunbar, M. J., Elliott, J. A., Extence, C., Hannah, D. M., Holmes, N., Johnson, A. C., Knights, B., Milner, N. J., Ormerod, S. J., Solomon, D., Timlett, R., Whitehead, P. J., and Wood, P. J. (2010). "Evidence needed to manage freshwater ecosystems in a changing climate: Turning adaptation principles into practice." *Sci. Total Environ.* 408(19), 4150-4164.
- Yates, D., Galbraith, H., Purkey, D., Huber-Lee, A., Sieber, J., West, J., Herrod-Julius, S., and Joyce, B. 2008: Climate warming, water storage, and Chinook salmon in California's Sacramento Valley. *Clim. Change*, 91(3-4), 335-335.
- Yates, D., Purkey, D., Sieber, J., Huber-Lee, A., and Galbraith, H. (2005a). "WEAP21 - A demand-, priority-, and preference-driven water planning model Part 2: Aiding freshwater ecosystem service evaluation." *Water Int*, 30(4), 501-512.
- Yates, D., Purkey, D., Sieber, J., Huber-Lee, A., Galbraith, H., West, J., Herrod-Julius, S., Young, C., Joyce, B., and Rayej, M. (2009). "Climate driven water resources model of the Sacramento Basin, California." *J. Water Res. Pl.-ASCE*, 135(5), 303-313.

- Yates, D., Sieber, J., Purkey, D., and Huber-Lee, A. (2005b). "WEAP21 - A demand-, priority-, and preference-driven water planning model Part 1: Model characteristics." *Water Int.*, 30(4), 487-500.
- Yoshiyama, R. M., Gerstung, E. R., Fisher, F. W., and Moyle, P. B. (2000). "Chinook salmon in the California Central Valley: an assessment." *Fisheries*, 25, 6-20.
- Yoshiyama, R. M., Fisher, F. W., and Moyle, P. B. (1998). "Historical abundance and decline of Chinook salmon in the Central Valley region of California." *N. Am. J. Fish. Manage.*, 18, 487-521.
- Yoshiyama, R. M., Gerstung, E. R., Fisher, F. W., and Moyle, P. B. (2001). "Historical and present distribution of Chinook salmon in the Central Valley." *Contributions to the biology of Central Valley salmonids*. R. Brown, ed., California Department of Fish and Game Fish Bulletin 179, 71-176.
- Young, C. A., Escobar-Arias, M. I., Fernandes, M., Joyce, B., Kiparsky, M., Mount, J. F., Mehta, V. K., Purkey, D., Viers, J. H., and Yates, D. (2009). "Modeling the hydrology of climate change in California's Sierra Nevada for subwatershed scale adaptation1." *J. Am. Water Resour. As.*, 45(6), 1409-1423.
- Zabel, R. W., Scheuerell, M. D., McClure, M. M., and Williams, J. G. (2006). "The interplay between climate variability and density dependence in the population viability of Chinook salmon." *Conserv. Biol.*, 20(1), 190-200.
- Zalewski, M. (2002). "Ecohydrology- the use of ecological and hydrological processes for sustainable management of water resources." *Hydrolog. Sci. J.*, 47(5), 823-832.



## List of Figure Captions

Fig. 1. Left: Assemblage of analytical framework, model coupling and data transfer, used to model historical conditions. P=precipitation, T<sub>air</sub>=air temperature, RH=relative humidity, Q<sub>obs</sub>=observed streamflow, T<sub>water obs</sub>=observed water temperature, R<sub>net</sub>=net radiation, Q<sub>mod</sub>=modeled streamflow, T<sub>water mod</sub>=modeled water temperature. Right: Analytical framework used to model future conditions.

Fig. 2. Location of Butte Creek watershed in California and watershed model domain with rivers, diversions, and management points used for subwatershed and catchments delineation. Highlighted in white circles in the lower Butte Creek river are CDFG spring-run Chinook salmon holding and spawning reach pools numbered as A1 (Quartz Bowl), C5 (above the inflow from Centerville Diversion), C7 (below inflow from Centerville Diversion) and E7 (location of USGS Chico gauge). The total length of the spawning and holding reach is 17 km, starting at Quartz Bowl and ending at USGS Chico Gauge.

Fig. 3. Streamflow and water temperature calibration. A) Observed (gray line) and simulated (black line) streamflow for 1986-2005. Calibration was focused on summer low flow periods. B) Observed (gray symbols) and simulated water temperatures (black solid and dashed lines) for spawning reach from Quartz Bowl to USGS Chico Gauge. Calibration focused on hot summer weeks, observations are weekly average water temperatures available at 7 different pools in the spawning reach, and simulated are average, minimum, and maximum weekly average water temperatures from July to September for 2000-2005. River kilometers in the x-axis refers to the distance from Butte Creek headwaters.

Fig. 4. SALMOD Calibration: A) Water temperature-mortality relationship based on Butte Creek spring-run Chinook salmon data (2001-2008), using weekly mean temperature and weekly mortality, B) Comparison of observed summer pre-spawn mortality (2001-2008) (squares), simulated mortality using observed weekly mean flow and water temperature data (2001-2008) (triangles), and simulated mortality using WEAP-simulated weekly mean flow and water temperature data (2001-2005) (circles).

Fig. 5. Simulated (A) streamflow and (B) water temperature change for periods 2009-2034, 2035-2069 and 2070-2099 for six General Circulation Models under A2 and B1 greenhouse gas emission scenarios, relative to 1986-2005 historical averages for annual ( $10 \text{ m}^3/\text{s}$ ,  $11^\circ\text{C}$ ),

summer ( $6 \text{ m}^3/\text{s}$ ,  $18^\circ\text{C}$ ) and winter ( $15 \text{ mm}$ ,  $5^\circ\text{C}$ ) simulated streamflow and water temperature, respectively. The 30-year mean changes are shown for visualization; weekly mean streamflow and water temperature was actually generated by WEAP and passed to SALMOD. For detailed explanations of the greenhouse gas emissions scenarios we refer readers to IPCC (2007, Figure 3.1) and for information regarding the General Circulation Models, to the California Applications Program / California Climate Change Center website on California's 2008 Climate Change Impact Assessment (<http://meteora.ucsd.edu/cap/scen08.html>).

Fig. 6. Water temperatures predicted for six General Circulation Models under A2 and B1 greenhouse gas emission scenarios (distribution of all General Circulation Models for 2009-2099 are graphed together for each scenario and pool) and historical modeled (1986-2005) weekly average water temperature distribution for weeks 24-39 for pools A1, C5, C7 and E7.

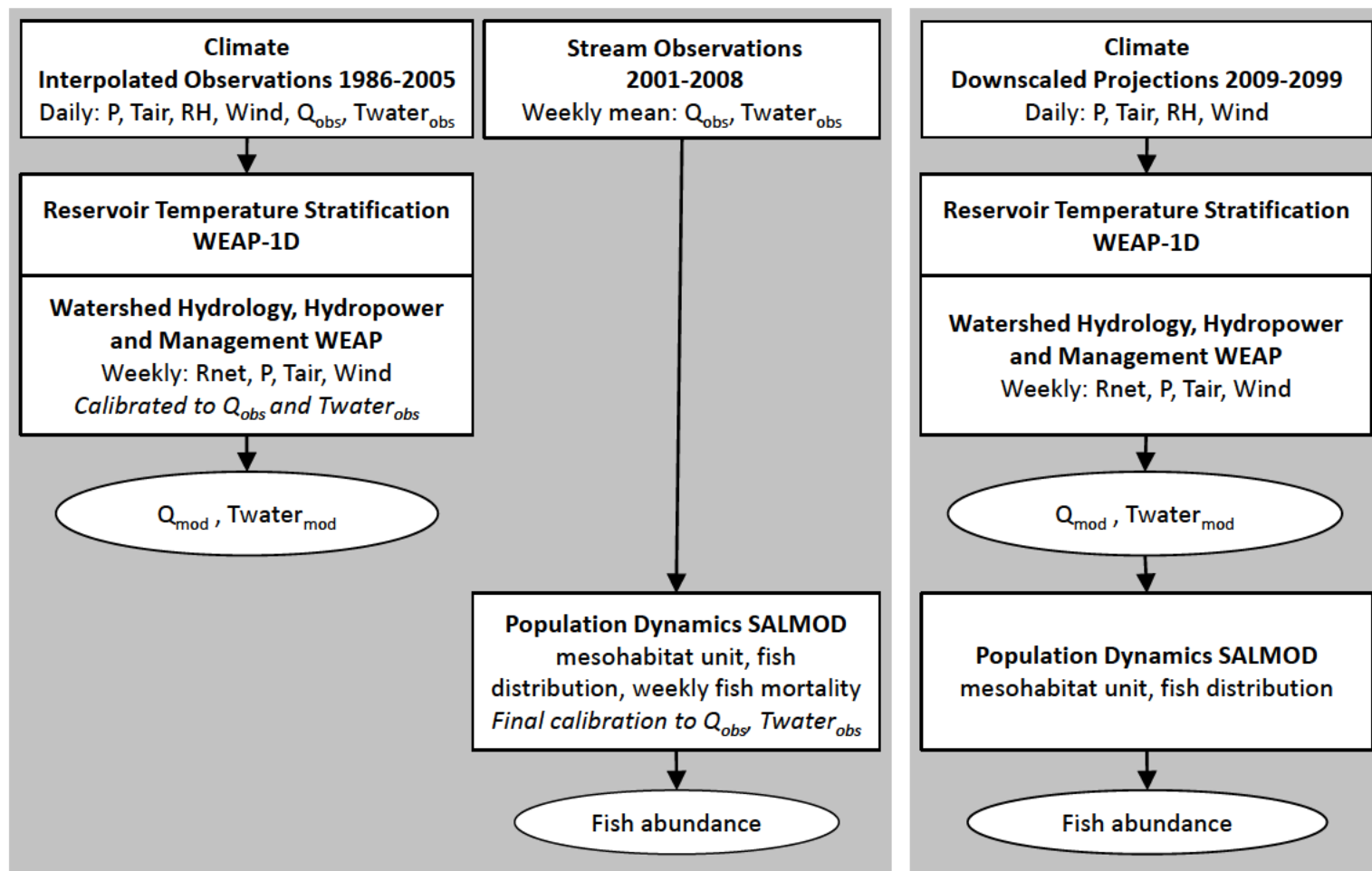
Fig. 7. Proportion of adult salmon that survived the freshwater summer holding period, predicted for six General Circulation Models under A2 and B1 greenhouse gas emission scenarios for 2009-2099. Salmon were assumed to be extirpated when there were four consecutive years with no adult summer survival.

Fig. 8. Water temperatures predicted for six General Circulation Models under A2 and B1 greenhouse gas emission scenarios and three management adaptations: 1-no diversion, 2-cold water savings, and 3-combination of both. The data for the twelve model and climate scenario combinations for 2009-2099 are graphed together for each pool A1, C5, C7 and E7. Y-axes show weekly average temperature distribution for weeks 24-39.

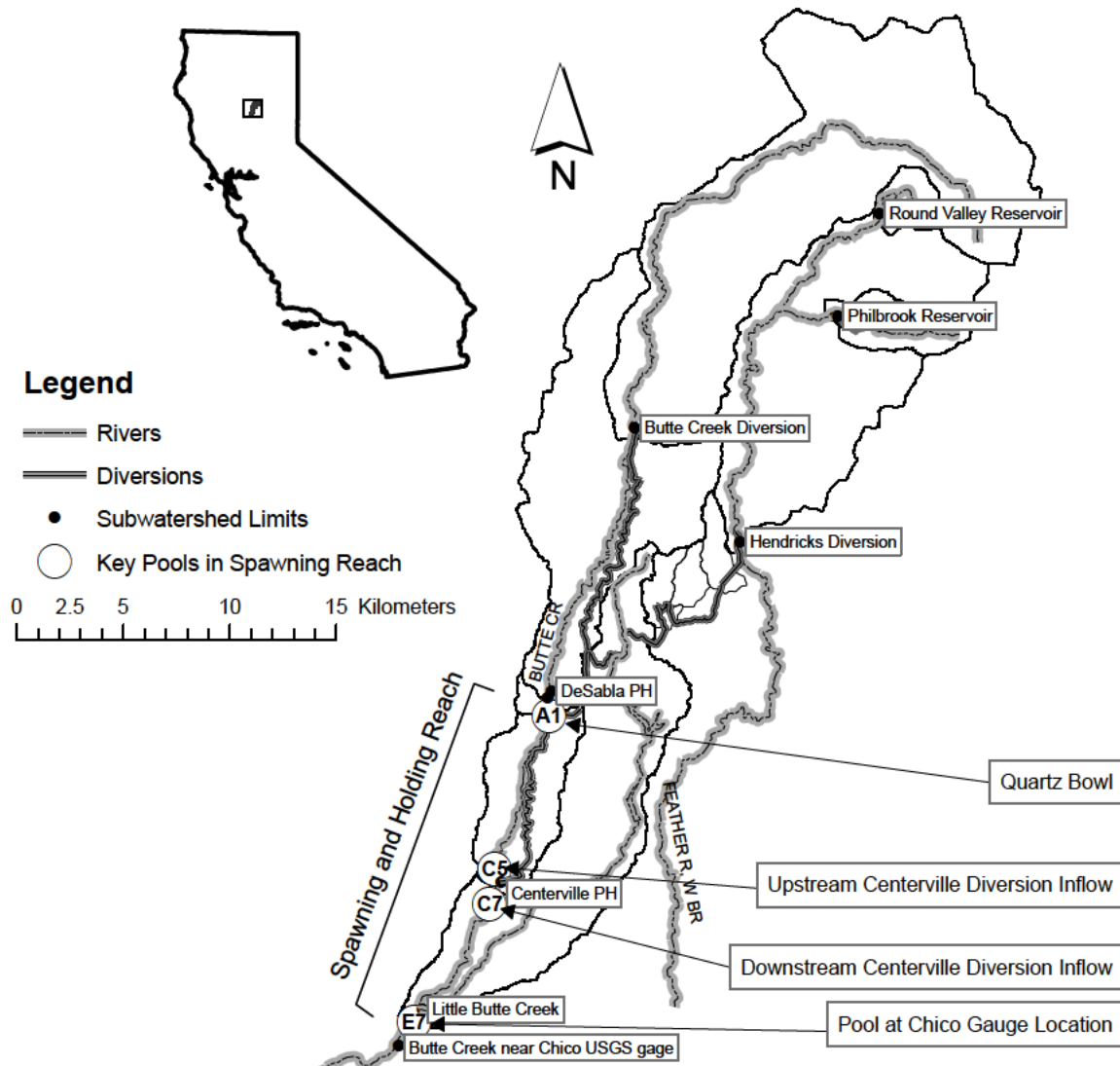
Fig. 9. Survival time of spring-run Chinook salmon in Butte Creek predicted by SALMOD for six General Circulation Models and A2 and B1 emission scenarios, for the baseline climate change case, and three management adaptations. Model was run for 90 years (October 2009 – September 2099).

Fig. 10. Proportional difference in annual survival of spring-run Chinook salmon in Butte Creek predicted by SALMOD for six General Circulation Models and A2 and B1 emission scenarios, for the three management adaptations, relative to the baseline climate change case.

Figure 1



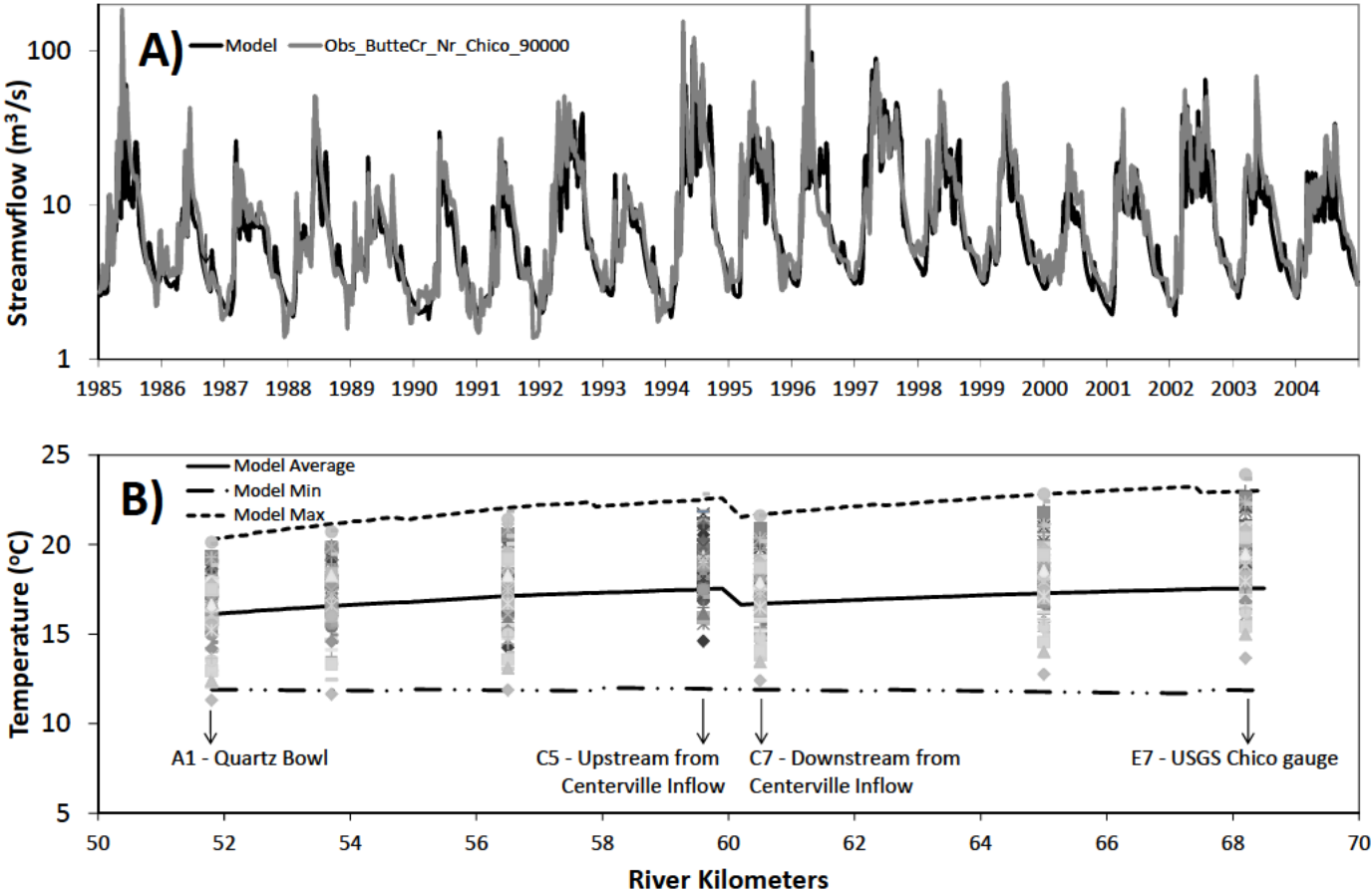
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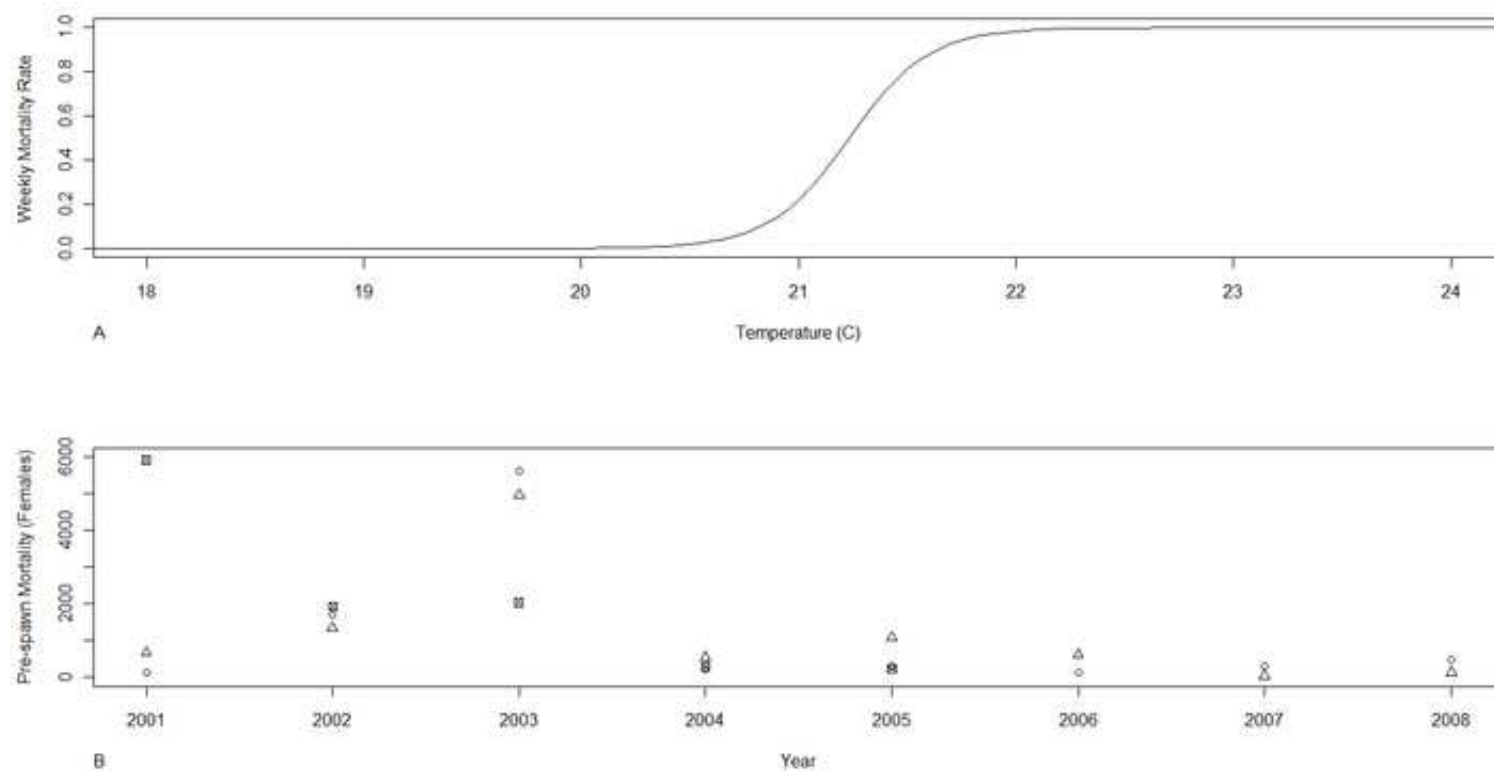
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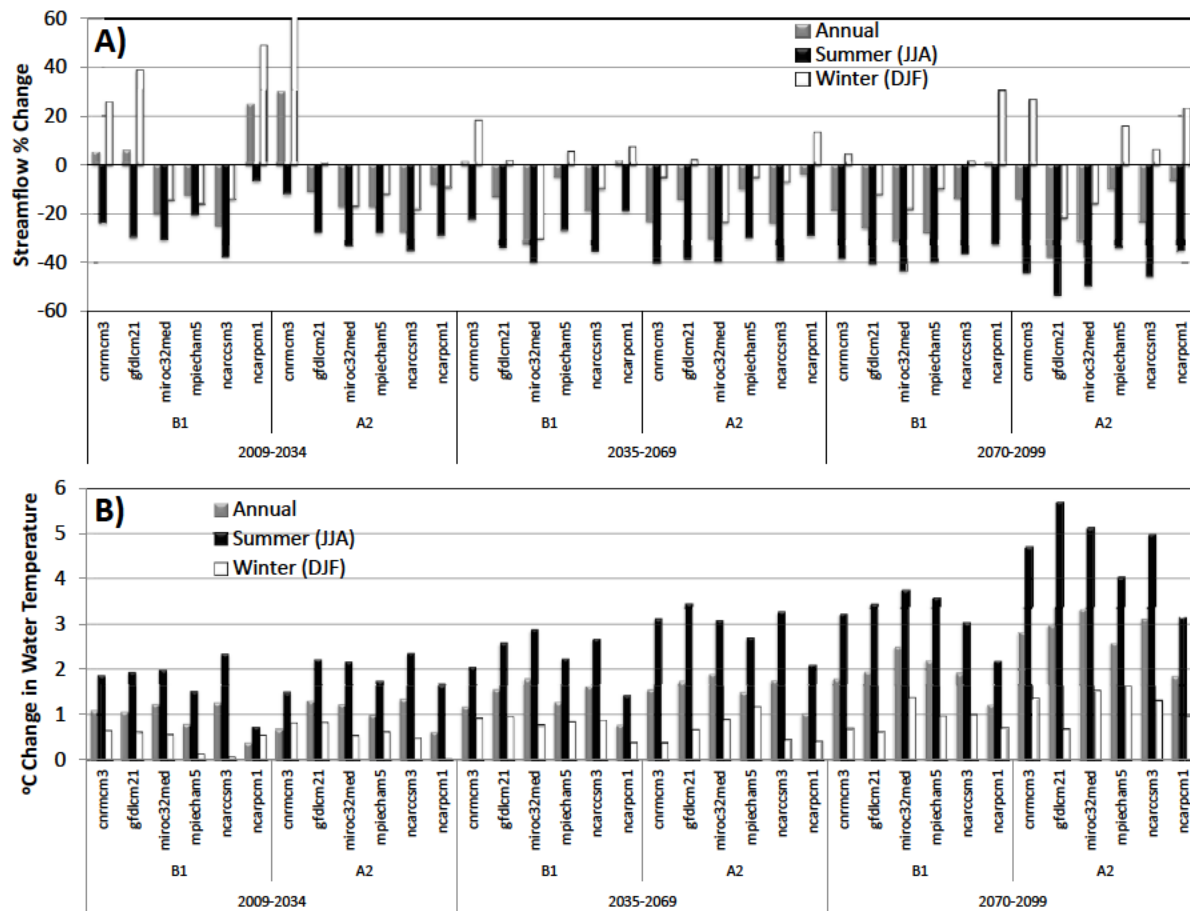
Figure 3

Journal of Water Resources Planning and Management. Submitted September 1, 2010; accepted August 29, 2011; posted ahead of print August 31, 2011. doi:10.1061/(ASCE)WR.1943-5452.0000194

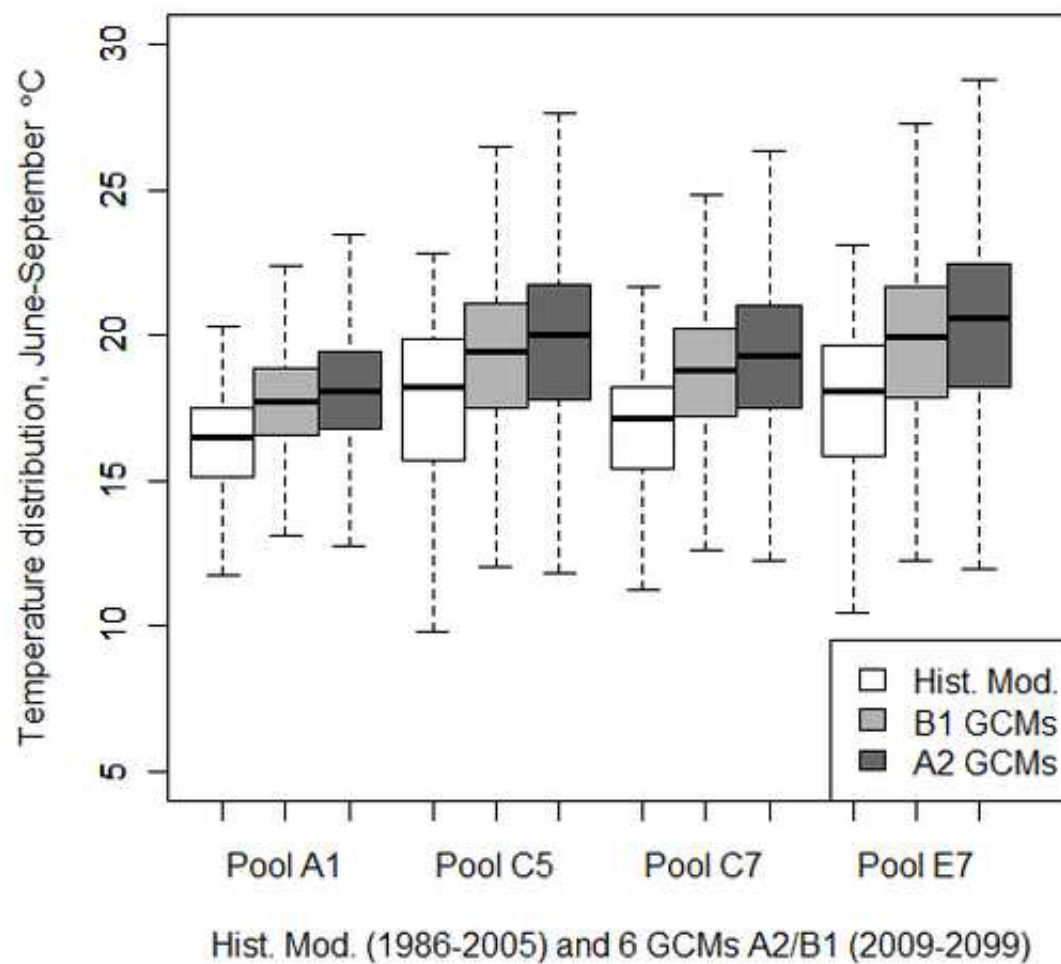


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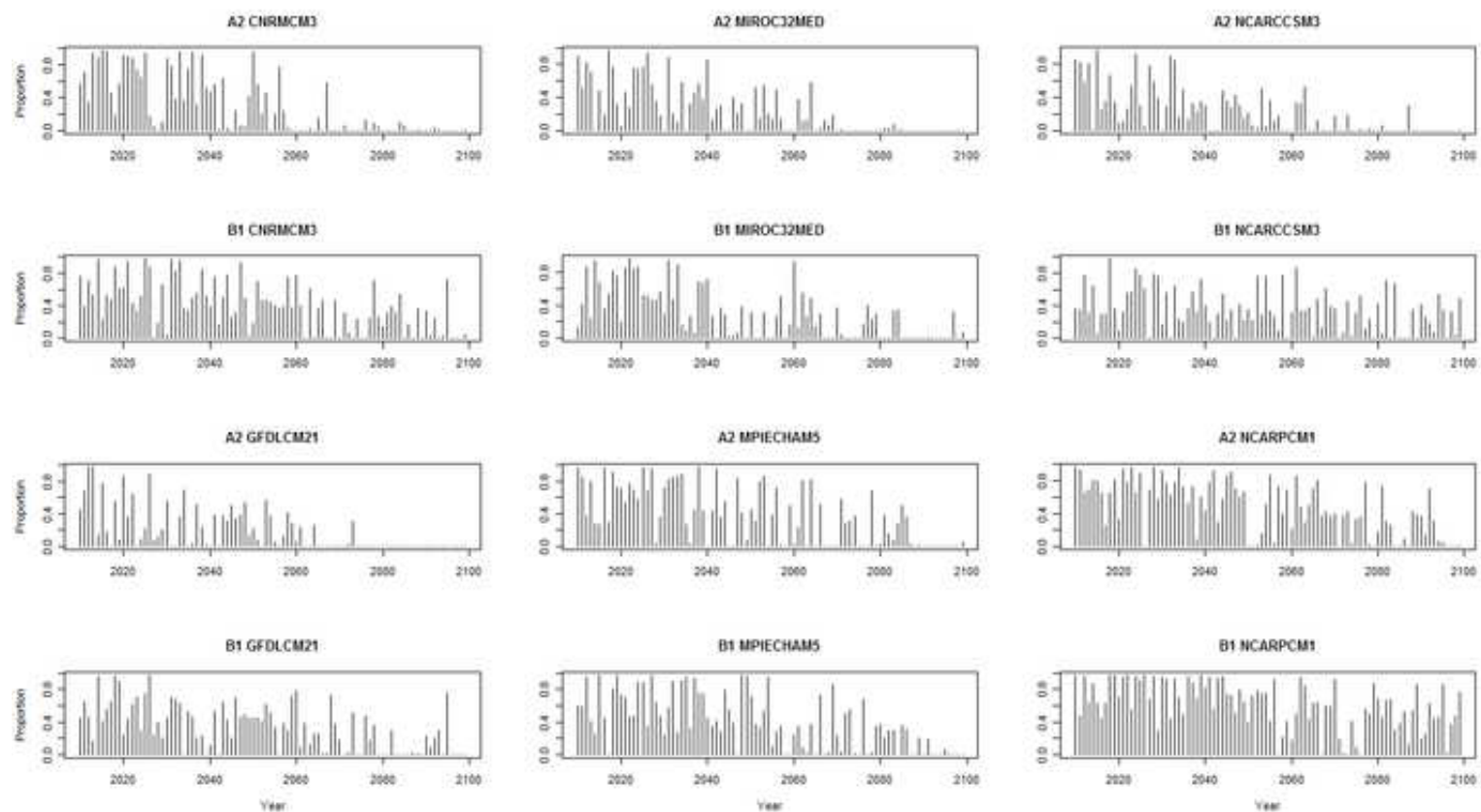


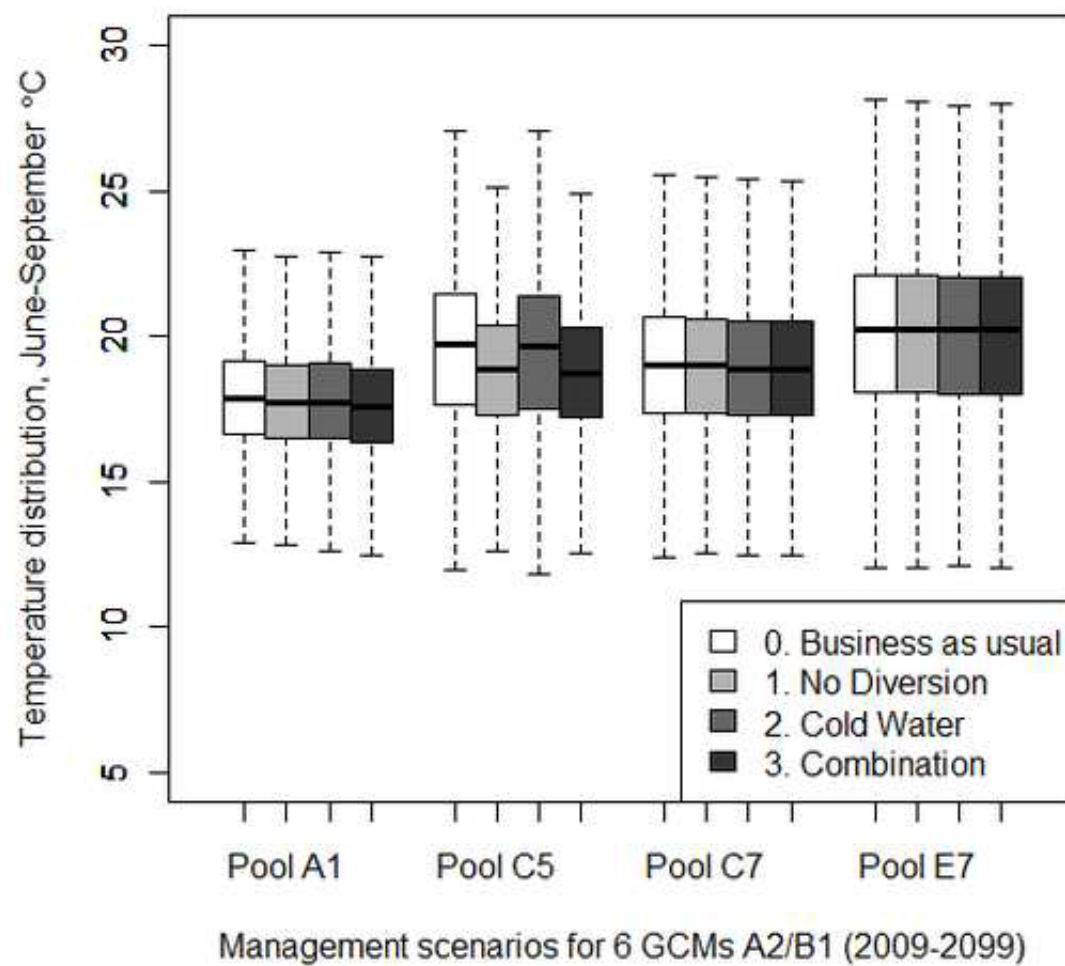


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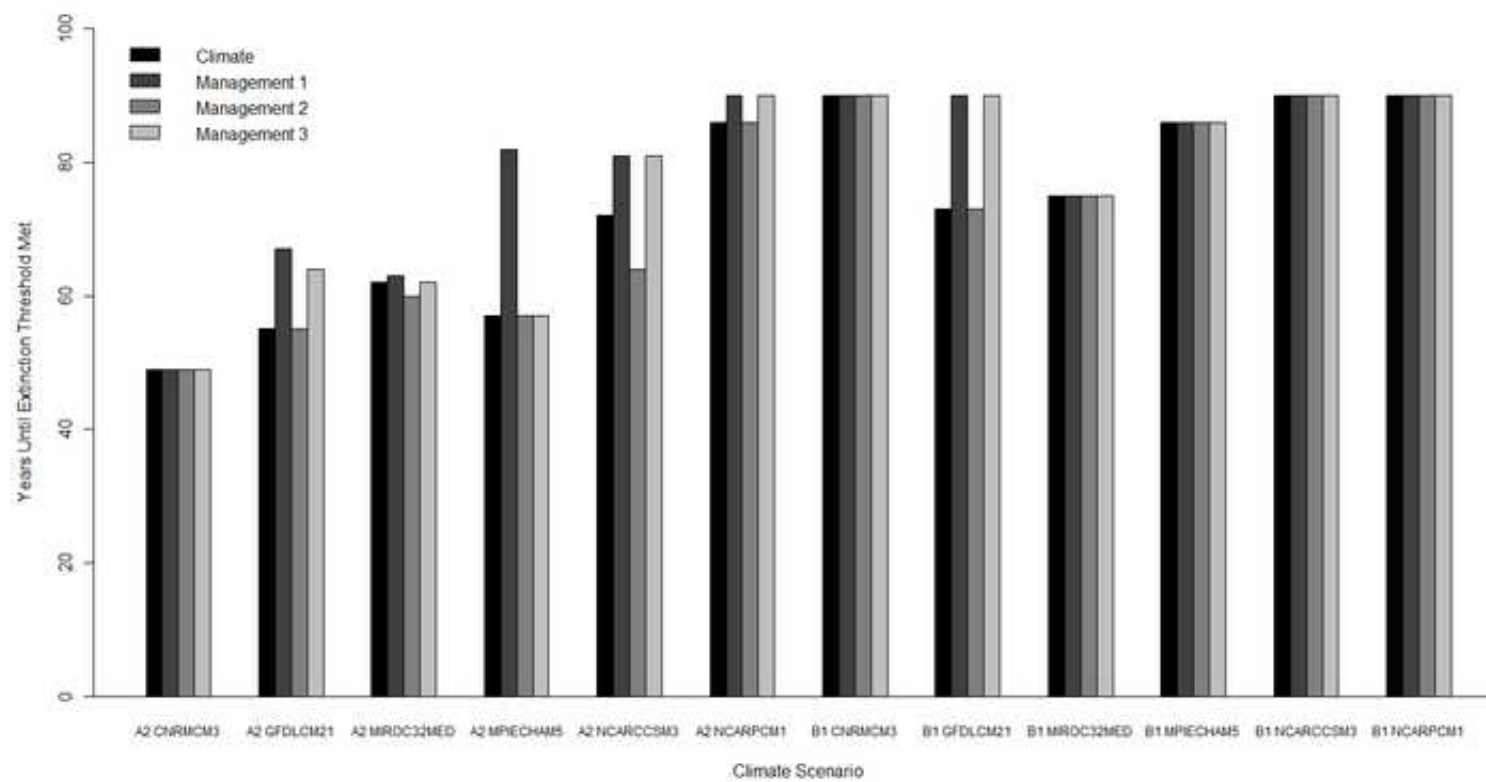
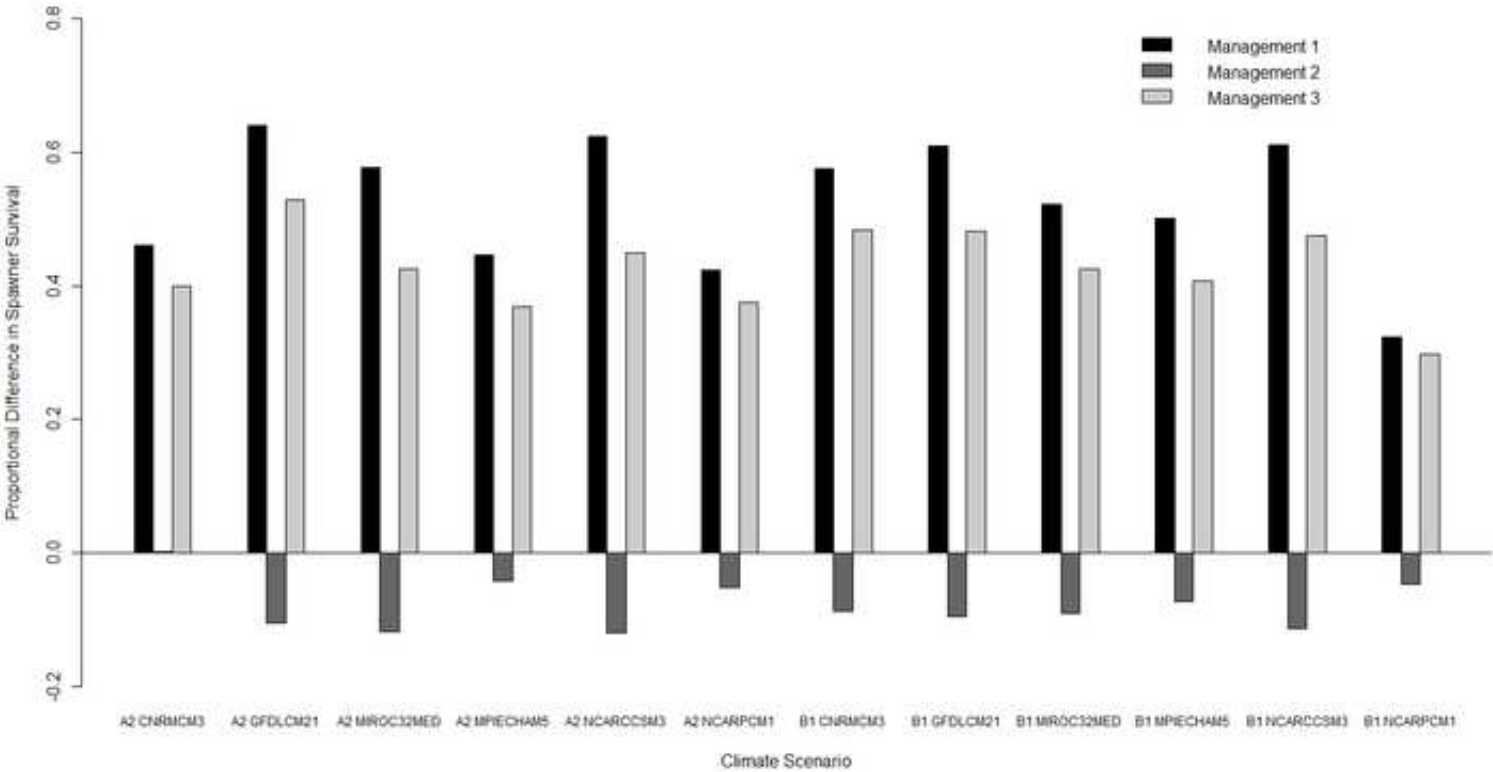


Figure10

Journal of Water Resources Planning and Management. Submitted September 1, 2010; accepted August 29, 2011; posted ahead of print August 31, 2011. doi:10.1061/(ASCE)WR.1943-5452.0000194



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**From:** Bernhardt, David L.  
**Sent:** Friday, September 9, 2011 3:16 PM  
**To:** Jason Peltier  
**Subject:** Out of Office AutoReply: Like.

Thank you for your message. I will be out of the office and unreachable by either email or phone through September 20. If you need assistance before the 20th, please contact either Jon Hrobsky or Ryan Smith at 2022967353.

Thanks,  
David

**From:** Jean Sagouspe

**Sent:** Tuesday, September 13, 2011 9:07 AM

**To:** Al Montna ; Berj Moosekian; Bill Cooper; Bill Kahrl; Bill Phillimore; Bill Pucheu; Bob Dowd ; Bob Glassman ; Bob Houlding; Bob Maddox; Bob Smittcamp; Brian Yansen ; Bruce Allbright; Bowles; Chris Hurd ; Chris White; Conrad Burns; Cork McIsaac; Corky Sherwood; Craig Manson ; Dave Houston; Dale Haskins; Dan Errotabere; Dan Keppen; Dan Nelson ; David Bernhardt; David Britz; Dave Wood; Dean Nelson ; Dennis Falaschi ; Dennis Soares; Denny Rehberg ; Devin Nunes ; Don Devine ; Don Peracchi; Doug Brown; Earl Perez; Eric Houston; Frances Mizuno ; Frank Watson; GARY SAWYERS; Gordon Gravelle; Greg Hyland; Jason Peltier; Jay R Dibble; 'Jeff Flores'; Jeff Hildebrand; Jill Burford Minnick; Jim Hansen; Jim Heath; Joe Findaro; Joe L Del Bosque; DeRuiter, J (John); John Diener; John Emersian; john harris; 'John Houston'; Jon D Rubin; Julie MacDonald ; Karen Clark ; Kenneth Khachigian; Kevin ( Cong) McCarthy; Kiel Weaver; Kole Upton ; Larry Enos ; Leo Giacometto ; Marc Himmelstein; Mark J. Mathews; Mark M. Borba; Mark Turman ; Martin McIntyre; Marvin Meyers ; Melinda Sherman ; Michael Silver; Mike Hubbard ; Mike Stearns ; Milligan, Ronald E; pat o'toole; Ray Appleton; Ray Sheets; Richard Pombo; Rodger Glaspey ; Ron Rayner; [REDACTED] @ [REDACTED] ; Saxby Chambliss ; Shawn Coburn; 'Steve Chedester'; Steve Patricio ; Steve Sagouspe; Sims, Steven O. ; Susan Ramos ; Tal Cloud; [REDACTED] @ [REDACTED] ; TOM BIRMINGHAM; Tom Ramos; Tony Azevedo; Tony Campos; Tony Coelho; 'Victor Arretche'; Ward Kimble; Wendy Lauchland; Zumwalt, Bryan (Vitter)

**Subject:** FW: Good Guys win one

---

**Jim is one of my directors on the CESAR board. CBD is a ruthless environmental organization and is involved in this type of activity all the time. This is how they fund their continued attacks on all of our rights. CESAR was formed to combat this type of activity and to provide sound science for the existing environmental laws. I am President of CESAR and proud of the fact that Jim Chilton and Dave Wood are helping CESAR make a difference in this new battleground. IF you would like to know more about our activities you can go to our web site BestScience.org.**

**CESAR needs all of your help to continue making a difference for our future and the future of our families. Please pass this around to all of your contacts as we need all the help we can get.**

**Jean**

### **[Extortion Funds Enviro Left Through Taxpayer Settlements](#)**

Jim Chilton is a fifth generation rancher—a cowboy. His ranch includes a grazing permit for 21,500 acres of Federal Forest Service lands south of Tucson, AZ. In 2002, when the USFS renewed his permit for another ten years, CBD went on the attack. The group published a news release and photographs online, alleging that Chilton was mismanaging his allotment. This was not Chilton's first altercation with CBD. He'd been a victim of previous unfounded attacks and allegations and was not surprised when they refused to take down the libelous and defamatory post and photos. As a "cowboy," Chilton says, "You stand up and fight for truth, justice, integrity, and honor." In June of 2003, Chilton filed suit against the CBD. With numerous rulings back and forth, a decision was reached in January 2005 that awarded \$600,000 in favor of Chilton in a defamation lawsuit—allowing him to recoup a portion of monies spent in the battle. CBD had distorted the facts and claimed photos were from the Chilton ranch—when in fact they were not. Referencing the CBD, the jury foreman said: "They acted irresponsibly, and they should have tried to work it out instead of wasting everybody's time." In May 2005, CBD asked the judge to throw out the verdict. Finally, on December 6, 2006, an Arizona District Court of Appeals upheld the decision in favor of Chilton—validating the rulings of the lower court. Addressing the experience, Chilton says, "They lie and

distort. They are not on the side of truth. The jury agreed because they voted 10 to 0 that the CBD had defamed me intentionally and with malice.”...[more](#)

**From:** Jason Peltier

**Sent:** Monday, September 19, 2011 2:38 PM

**To:** Dan Keppen; Bennett Raley (bennettraley@me. com); Mark Limbaugh; findaro@akerman. com; David Bernhardt

**Subject:** FW: Secretary Salazar's comments in SF////sad

**Attachments:** Salazar 09-18-11\_Commonwealth Club\_final.pdf

There is an incredible political/partisan construct at the beginning of this that is a demonstrable failure to translate DC partisanship to us common folk. What an insult.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Monday, September 19, 2011 2:17 PM

**Subject:** Secretary Salazar's comments in SF

Attached.



**Remarks of Secretary of the Interior Ken Salazar**  
**The Commonwealth Club, San Francisco, CA**  
**September 19, 2011**

*As prepared for delivery*

Good morning.

It is an honor to be here at the Commonwealth Club.

With me here today is Deputy Secretary of the Interior David Hayes. Many of you know him. He is a champion for California's water, and has devoted much of his career to finding solutions to some of the nation's most difficult water challenges.

Also with me is Bureau of Reclamation Commissioner Mike Connor. His steady hand and common sense have helped settle century-old Indian water rights disputes, defused potential powder kegs, and put our nation on track toward healthier rivers and more secure water supplies.

Today, I want to talk about the debate raging in Washington, DC over the future of our country, and what it means for the water supplies we depend on in the West.

Americans are being presented two competing – and fundamentally different – visions of who we are as a people and how we tackle the economic challenges we face.

One vision is of an America where – when things get tough – we stand together, we work together, and we do big things together.

That's how we won our independence. It's how we defeated fascism. It's how we built the national park system, our highways, our dams, and the infrastructure that was once the envy of the world.

The other vision is of an America where – when things get tough – it’s everyone for themselves. It’s a place where we give up on the rules and standards that give us clean water, abundant wildlife, and open lands to hunt, hike, and fish. It’s a place where we cut taxes for the few and abandon the less fortunate among us, rather than make the investments we need to compete and win. It is a smaller America... a less confident America... with fewer dreams and less courage.

The struggle between these competing visions is being carried out in the battles over the President’s jobs plan and whether to renovate schools, fix roads, rebuild bridges, cut taxes for small businesses, and put first responders and teachers back to work.

The struggle between those visions for America is also being carried out in the arena of water in the West.

Never before have water agreements that provide security and certainty for Westerners been so at risk.

It’s a battle between pragmatism and ideology. Collaboration versus cynicism.

From the San Joaquin River and the California Bay Delta to the Klamath River Basin, a few passionate and unyielding players want to unravel decades of work to forge consensus, solutions, and settlements to some of the most complex water challenges of our time.

On the San Joaquin River, a few Members of Congress are bent on killing a restoration program that is restoring water flows to the river, bringing stability and certainty to agricultural users, and that will bring the first salmon runs in half a century.

In California’s Bay Delta, a plan to modernize and secure the State’s aging and inadequate water supply system is always the target of pot shots. Yet the bottom line is the health of the Delta is inextricably linked to the security of safe and reliable water supplies.

And in the Klamath River Basin, an historic settlement has moved us beyond the water wars of the early 2000s. There is real hope for a healthier basin and a stronger economy, yet even there naysayers are working to derail the deal.

I want to talk about each of these basins and why now is the time to stand firm – together. We must defend the hard-gained agreements and collaborations we have built over the last decade.

First, it's important to remember what is at stake.

I have worked on water issues my entire life. I know what happens when settlements break down and when promises are broken. You re-enter a cycle of litigation, gridlock, and paralysis.

They say whiskey's for drinking and water's for fighting, but that's not really the way of the West.

I grew up in Colorado's San Luis Valley. My family has farmed and ranched our land for five generations. Before that, we worked the land of northern New Mexico, since before the United States was even a country.

My parents taught me that our way of life depended on the health of the land, water, and wildlife around us.

They also taught us that it takes a community to be successful. It took many hands, and many years, to build the acequias and ditches that fed our crops.

And when I was Attorney General of Colorado, it took farmers, ranchers, water districts, and conservationists – all working together - to defeat a water grab that would have hurt our San Luis Valley. We worked together to protect our water supplies. And together in that effort, we even established Great Sand Dunes National Park.

---

It was true then, and it is true now: the challenges we face on water in the West are too big for any of us to ‘go it alone.’

More and more, our futures are intertwined.

In California, more than 25 million people rely on the California Bay-Delta for clean drinking water, yet the state’s water infrastructure was built for a population half as large.

Meanwhile, larger forces are placing even more strain on our system.

As a result of climate change, snowpack patterns are changing. Run-off is happening sooner. Wildlife is moving to different areas. Water managers are having to adjust. And we all worry how – over the long-term – more severe droughts and weather will affect our way of life.

We can’t ignore this reality. It does no good to blame the scientists or bury our heads in the sand.

So let’s talk about solutions.

Over the past two and a half years, we have made unprecedented progress on water settlements and river restorations throughout the West.

In November, 2010, President Obama signed into law four major Indian water rights settlements that resolve decades and decades of litigation. The settlements, totaling more than \$1 billion, will help deliver clean drinking water to Indian communities – such as the Crow in Montana, the White Mountain Apache in Arizona, and several Pueblos in New Mexico – while providing certainty to water users across the West.

And just this Saturday, I was at the Elwha River in northwest Washington, where we launched one of the largest river restorations in U.S. history.

We are poised to make historic progress on three other major water settlements here in California - provided we stand firm, together.

I want to talk about each of them, briefly.

### **Klamath River Basin**

First, in the Klamath River Basin, severe drought and strain on the system exploded in 2001 with water shortages for agriculture and other users. It was followed in 2002 by the largest fish die off in the Basin's history, if not in U.S. history.

After years of litigation, the parties reached an agreement, signed in early 2010. Under that agreement, the parties are to undertake a comprehensive environmental and economic analysis of the impacts of removing four dams on the Klamath River.

The agreement, which the Obama Administration stands behind fully, sets up an open, transparent process for choosing the best path for the Klamath Basin. Science and public engagement are at the heart of the process.

That's why, for the past several months, the Department has been publicly releasing the individual science reports as they become final. The Draft Environmental Impact Statement, which compliments these scientific studies, will be available for public review and comment beginning Thursday.

The analysis and studies will say a few things.

First, they will show there are pluses and minuses to dam removal on the Klamath River. The studies estimate that dam removal would result in the loss of hydroelectric power generation and the loss of around 50 jobs from managing those facilities. It would also result in the loss of some recreational opportunities on the Klamath River reservoirs, and some decrease in property values for landowners nearby.

On the other hand, the watershed-wide restoration program that is proposed could add more than 4,600 jobs to the regional economy over 15 years, including around 1,400 during the year of dam removal. The studies say that the reliability in water supplies that would be gained would boost gross farm income and add between 70 and 695 jobs annually to the agricultural economy.

Moreover, Klamath restoration would help address tribal trust issues for the Klamath River Basin Tribes and would be beneficial to their water quality, fisheries, and traditional cultural practices.

The analysis also suggests there would be benefits to commercial salmon fishermen. It seems like more often than not in the last decade, there have been salmon fishery closures in California or Oregon.

With removal of the dams, though:

- coho would reclaim 68 miles of historical habitat;
- steelhead, the Klamath River's most popular sport fishery, would regain 420 miles of historical habitat; and
- commercially harvested Chinook salmon production would increase by more than 80 percent .

All together, eleven coastal counties in Oregon and California would see gains of more than 400 jobs as a result of improved fishing conditions.

Those are significant numbers.

But we will also be looking closely at the cost of the restoration.

The analysis that will be available Thursday will show that the most probable cost of removing the four dams is around \$290 million in 2020 dollars, which is below the \$450 million state cost cap identified in the KHSA.

To date, we have maintained a very public process. But we need the continued input of the public and local communities on the draft EIS.

Their voices – and all of the economic, environmental, and scientific information we have gathered - will be critical as I approach my decision on dam removal in the Klamath River Basin in March, 2012.

## **San Joaquin River**

The second water settlement and river restoration I want to discuss is on the San Joaquin River.

The San Joaquin flows from the high Sierra Nevada into the San Francisco Bay. It is the lifeblood for some of the richest agricultural land in the nation. It also used to be home to magnificent salmon runs from the Pacific Ocean in the spring

Those runs disappeared, though, when the river stopped flowing half a century ago.

After 18 years of court battles that affected water districts, farmers, and other interests, the parties reached a settlement in 2006. Then, with the determined leadership of Senator Diane Feinstein, and the full support of the President, Congress endorsed and codified the settlement as part of the Omnibus Public Lands Act of 2009.

The San Joaquin River Restoration Program is remarkable. It's an example of a thoughtful and measured solution that balances the public interest for a vibrant river system and sustainable salmon populations, while minimizing or reducing impacts to farmers in the San Joaquin Valley.

And the program has achieved significant successes. With the exception of floods, this past year was the first time in half a century that the San Joaquin River ran from its headwaters to the ocean. This year, State and federal agencies showed that salmon can successfully migrate downstream through the restoration area. That's a great sign for the long-term success of the program.

These settlements, of course, take patience and flexibility from all parties. The San Joaquin settlement contains clear deadlines, but the two and a half years it took to pass the legislation have strained the timeline a bit.

Make no mistake: we will reintroduce spring-run salmon to the San Joaquin River, but full reintroduction may take a bit more time. Our professionals must complete brood stock collection, develop a conservation hatchery, and complete studies of tagged salmon to learn about their survival rates in the existing and restored channel.

We are conducting a scientific review right now to determine whether reintroduction of spring-run salmon as originally contemplated in the Settlement will need to be delayed. The partners in the settlement – including the Friant Water Users and NRDC – are working with us closely every step of the way.

The challenges we are facing affirm the need to be practical in our implementation of this settlement. They are NOT, however, a reason to back away from the settlement.

Yet, a few members of California's delegation in the House of Representatives are proposing a path to failure on the San Joaquin River. They are proposing to nullify the settlement or starve it of resources.

Killing the settlement would only lead to more litigation and more economic uncertainty. And renewed conflict would inject renewed chaos in the management of California's already over-stressed water resources.

For the benefit of all of us – farmers, industry, cities, fishermen – the San Joaquin River should flow again.

**California Bay Delta**



Finally, I want to talk briefly about the California Bay-Delta.

We all know the facts about the Bay-Delta.

Twenty-five million Californians rely on it for clean drinking water, yet the system that moves water through the Delta was built for a population half the size.

The system is at high risk of catastrophic failure if there is an earthquake, levee breeches, or natural disaster.

Moreover, the Bay-Delta itself is in a state of environmental collapse.

Fish populations in the delta have been declining for years. The delta smelt is at risk of extinction and the commercial and recreational salmon fishing season in California was closed for almost three years.

We are just now emerging from a severe drought in California, which resulted in painful pumping restrictions for farmers, industry, and many cities.

Today, we are in a far better place than we were when I came into office in 2009. Yes, we have been blessed with rainfall this year, and reservoir levels have risen.

But we have also made landmark progress on forging a sustainable, long-term solution for the Bay-Delta that meets the twin goals of improving the reliability of water supplies while restoring the health of the Delta.

In 2009, thanks to Recovery Act investments, we undertook more than \$400 million of water infrastructure projects in California to assist with drought relief, build fish screens, improve water re-use, and restore habitat.

Later today, we will dedicate one of those projects. The Contra Costa fish screen project will help prevent fish from entering the Contra Costa Canal through the Rock Slough intake.

The engineers, welders, and construction crews on the project are among the more than 5,000 people who have gone to work on water infrastructure projects in California thanks to the investments we made in the last two years.

These projects will make a difference, but they are only part of the long-term solution.

That solution is the Bay Delta Conservation Plan.

The Bay Delta Conservation Plan is the most important – and most complex – long-term water and habitat management plan ever undertaken.

The BDCP provides a comprehensive approach that includes new habitat for endangered fish species, coordinated measures to attack toxics that are fouling delta waters, and improvements to the state's water infrastructure.

Rather than simply pumping water from north to south through the Delta – which places immense strain on the system and is unreliable – a new conveyance system would reduce direct conflicts between water supply and fisheries, as the Delta Vision Blue Ribbon Task Force and many independent scientists have recommended.

This type of a comprehensive approach is long overdue. We simply must find a way to put California on a path to restore the delta and protect in-Delta interests - while also securing a more reliable water supply for its future. These are the “co-equal goals” required by the landmark law that the California legislature passed in 2009.

That's why, for the past two and a half years, my Department has committed a vast amount of energy to advancing the BDCP.

It was an effort that -frankly - the previous presidential administration ignored and neglected.

The State of California, however, has been a strong partner.

Governor Brown, Secretary John Laird, and others have further accelerated the good work we did with Governor Schwarzenegger.

We are now at a critical point for the Bay Delta Conservation Plan.

And our success, in my view, will depend on three basic things.

First, we have to remain faithful to the open, collaborative, and transparent process that brought the Bay Delta stakeholders together in the first place. Farmers, cities, counties, fishermen, and citizens from north to south all have a stake in the success of the BDCP. We must continue to find common ground, and stay focused on our shared interests.

Second, we have to invest in and rely upon the best science available to guide us. Moving millions of acre-feet of water through, under, or around the Bay Delta will be complicated. If we are to succeed, we need the best science from inside and outside of government. And we should not hesitate to have independent scientists review and validate what is planned. We have to get this right.

Third: we have to move quickly. Working with the State, we have set a timeline for completing the draft environmental analysis by June 2012. Our final plan will be complete by early 2013. David and Mike are in fact here today for meetings with state officials, water users, and NGOs to continue to push forward to meet that schedule and to produce a scientifically sound BDCP.

I'm confident that with their leadership, the leadership of the Brown Administration, and faithfulness to collaboration, openness, and science, we will get this done.

## **Conclusion**

At the outset, I suggested that the Klamath, the San Joaquin, and the Bay Delta present the type of choice on water issues that our nation is facing in the economic arena.

It is a choice about who we are and how we meet the challenges of the day.

Has America become a place where it is every man and woman for themselves, or are we a nation that can still do big things? Are we cynics, or are we leaders? Can we still collaborate, innovate, and make the changes we want to see?

It is said that “when the well is dry, we learn the worth of water.”

So, too, do we value partnership and collaboration when cynicism and division prevails.

Now – more than ever - we must stand together. We must set aside partisanship and rancor, and rekindle the spirit of shared sacrifice and shared purpose that has lifted our nation in its darkest hours.

Failure is not an option. In Washington, Congress needs to pass the American Jobs Act and put people back to work right now.

And here in California, we need to rise to the water challenges we face. On the Klamath, on the San Joaquin, and in the Bay Delta, we have a chance to unleash the full potential of three powerful natural systems.

If we succeed, we can move beyond the water wars that have divided us. We can bring new jobs to farmers, fishermen, and workers across the state. And we can see a day when our children and grandchildren experience the force of three great American river systems, healthy again.

Let's get to work.

Thank you.

**From:** Karen Clark

**Sent:** Tuesday, September 20, 2011 10:00 AM

**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos

**Subject:** PR/Legislation Conf. Call

All,

Tom will be on vacation on Friday and therefore we won't have a PR/Legislation conference call.

Thanks!

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(o) 559.241.6234*

*(f) 559.241.6277*

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Gayle Holman  
**Sent:** Tuesday, September 20, 2011 10:58 AM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conf. Call

Good job! You know I hold you *responsible* whenever we have these good turns of events. ☺

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

-----Original Message-----

**From:** Karen Clark [mailto:[kclark@westlandswater.org](mailto:kclark@westlandswater.org)]  
**Sent:** Tuesday, September 20, 2011 10:00 AM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
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*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Karen Clark  
**Sent:** Tuesday, September 20, 2011 11:13 AM  
**To:** Gayle Holman  
**Subject:** RE: PR/Legislation Conf. Call

I try, Gayle. I try :)

~Karen

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*Executive Assistant to Thomas W. Birmingham*  
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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Gayle Holman [mailto:gholman@westlandswater.org]  
**Sent:** Tuesday, September 20, 2011 10:58 AM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conf. Call

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**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

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**Sent:** Tuesday, September 20, 2011 10:00 AM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Sheila Greene; Susan Ramos  
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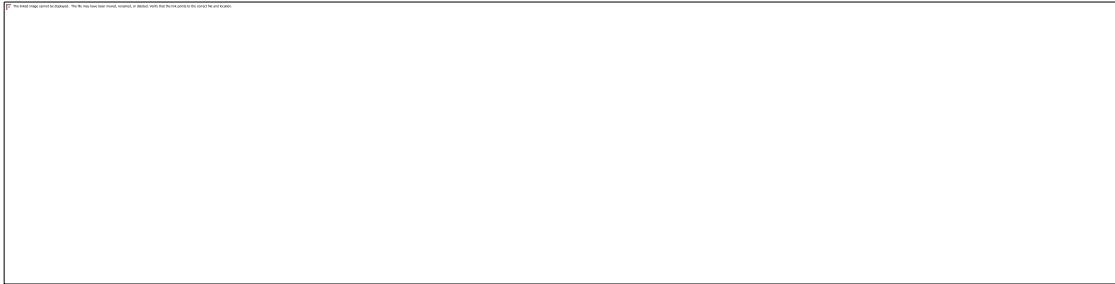


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**From:** joe.findaro@akerman.com  
**Sent:** Tuesday, September 20, 2011 11:24 AM  
**To:** kclark@westlandswater.org  
**Subject:** RE: PR/Legislation Conf. Call

thx

[V Card](#) | [Bio](#) | [akerman.com](#)



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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Tuesday, September 20, 2011 1:00 PM  
**To:** Tony Coelho; Bill Kahrl; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Findaro, Joe (OC-DC); Sheila Greene; Susan Ramos  
**Subject:** PR/Legislation Conf. Call

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~Karen

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**From:** Bernhardt, David L.

**Sent:** Tuesday, September 20, 2011 2:04 PM

**To:** Tom Birmingham; Jason Peltier; joe.findaro@akerman.com; Craig Manson

**Subject:** FYI-- This ran in E and E today

ENDANGERED SPECIES:

## Judge rips Interior scientists for 'outrageous' testimony in delta smelt case

Mike Soraghan, E&E reporter

Published: Tuesday, September 20, 2011



A federal judge in California excoriated Interior Department scientists for dishonesty last week, even as he largely granted the government's wishes for preserving the threatened delta smelt.

"I have never seen anything like what has been placed before this court by these two witnesses," U.S. District Judge Oliver Wanger said in his ruling on the smelt case, according to a [transcript](#) obtained by *E&ENews PM*. "The only inference that the court can draw is that it is an attempt to mislead and to deceive the court."

Wanger did not use the term "scientific misconduct," or "lying," but he used nearly every other adjective that describes deception by scientists as he built the record in his ruling for a finding of "bad faith." He called their testimony "false," "outrageous," "incredible," "unworthy of belief" and more.

Still, he gave federal lawyers much of what they had sought. The Interior Department is seeking to push encroaching salt water back in the Sacramento-San Joaquin Delta to help the tiny fish that is at the heart of the delta's water wars.

"The court finds agency bad faith here. There simply is no explanation. There is no justification," Wanger said. "And again, the government wins."

Wanger found that there is support to keep encroaching salt water west of the confluence of the Sacramento and San Joaquin rivers. The federal government had sought to push the encroaching salt water back to a point about 46 miles from the Golden Gate Bridge. Instead, Wanger's ruling pegged the spot at no closer than about 49 miles from the Golden Gate.

The fish was first federally protected as an endangered species in 1993. It has low fertility rates and favors a narrow zone of water with the right salinity levels that shifts locations in the delta depending on freshwater flows. Where the fish spawn is still a mystery: To date, only one delta smelt egg has been found in the wild.

But the species' fate reflects another problem -- California's dependence on the ailing delta for much of its water. Other fish that use the delta, including the chinook salmon and green sturgeon, are also in trouble.

On Monday, Interior Secretary Ken Salazar attended the dedication of a stimulus-funded project for the delta and delivered a speech about the California water situation.

"We have to invest in and rely upon the best science available to guide us," Salazar said. "If we are to succeed, we need the best science from inside and outside of government. And we should not hesitate to have independent scientists review and validate what is planned. We have to get this right."

**'Serious, serious trouble'**

Wanger called a Fish and Wildlife Service scientist who had testified in the case a "zealot" who did not let facts get in the way of her goals.

"She may be a good scientist. She may be honest, but she has not been honest with this court," he said.

He called a Bureau of Reclamation scientist "untrustworthy as a witness."

"And I will note that he is a government agent," Wanger said. "And the United States, as a sovereign, has a duty not only in dealing with the court, but in dealing with the public to always speak the truth, whether it's good or bad."

Last year, the Fish and Wildlife Service determined that a reclassification to "endangered" was warranted for the delta smelt, but it did not take action because of a backlog.

Wanger, who was nominated for the bench in 1991 by then-President George H.W. Bush, has cut a larger-than-life figure on the California bench with outspoken opinions on some of the major issues of the state.

The ruling could be one of his last. Late last month, he announced that he is retiring at the end of September to re-enter private practice.

"Protecting endangered species is crucially important," Wanger said. "But when it overwhelms us to the point that we lose objectivity, we lose honesty, we're all in a lot of trouble. Serious, serious trouble."

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
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**From:** Jason Peltier

**Sent:** Tuesday, October 11, 2011 8:27 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Bill Kahrl'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Sheila Greene'; 'Susan Ramos'

**Subject:** from Human Events web site

## SunPower: Twice As Bad As Solyndra, Twice As Bad For Obama

Congressman's son lobbied for failing solar panel company

by **Neil W. McCabe**

10/11/2011

**19**  
**Comments**



*A photovoltaic solar panel ranch similar to the California Solar Valley Ranch under construction by SunPower in the state's San Luis Obispo County. The \$1.2 billion loan guarantee to support the project was finalized in hours before the loan program expired Sept. 30. The company announced Aug. 5 that it will build the panels for the ranch at a new factory it will open in Mexico.*

DOE photo

How did a failing California solar company, buffeted by short sellers and shareholder lawsuits, receive a \$1.2 billion federal loan guarantee for a photovoltaic electricity ranch project—three weeks after it announced it was building new manufacturing plant in Mexicali, Mexico, to build the panels for the project.

The company, SunPower (SPWR-NASDAQ), now carries \$820 million in debt, an amount \$20 million greater than its market capitalization. If SunPower was a bank, the feds would shut it down. Instead, it received a lifeline twice the size of the money sent down the Solyndra drain.

Two men with insight into the process are SunPower router Rep. George R. Miller III, (D.-Calif.), the senior Democrat on the House Education and Workforce Committee and the co-chairman of the Democratic Steering and Policy Committee, and his SunPower lobbyist son, George Miller IV.

Miller the Elder is a strong advocate for SunPower, which converted an old Richmond, Calif., Ford plant in his district to a panel-manufacturing facility.

The congressman hosted an Oct. 14, 2010, tour of the plant with company CEO Thomas H. Werner and Interior Secretary Kenneth L. Salazar to promote the company's fortunes.

"The path to a clean energy economy starts here, in places like SunPower's research and development facility," said Salazar during the tour.

"The work that comes from these facilities transforms renewable energy ideas into a reality. When renewable energy companies continue to invest in places like California, the realization of a new energy future is within our reach," he said.

Miller the Elder said he was grateful for Salazar's interest.

"We've worked hard to make renewable energy a priority because it represents America's future economic growth. Today, businesses like SunPower are moving forward, hiring 200 people for good clean energy jobs in the East Bay," he said.

"By fostering a business climate that encourages companies like SunPower, even more good jobs will be created locally, we'll reduce demand for dirty energy sources, and we'll cut customers' utility bills. That's the right direction," he said.

SunPower's political action committee (PAC) was not shy about participating in the political process either.

According to the SunPower PAC filings for its activities in the 2010 midterm election campaign cycle, it donated more than \$36,000. Of the \$15,650 donated to House and Senate candidates, \$14,650 went to Democrats, with these top recipients: \$4,000 to Sen. Harry Reid (D.-Nev.), \$3,000 to Rep. Gabrielle Gifford (D.-Ariz.) and \$2,900 Sen. Barbara Boxer (D.-Calif.).

The congressman was not forgotten either. The SunPower PAC remembered him with \$500 for his 2010 campaign. While SunPower was a financial partner in the congressman's reelection campaign, it straight-out hired his son.

Miller the Younger is not registered to lobby in Washington, but he is a member of its bar. He is not a member of the California bar, home of his lobbying firm, Lang, Hansen, O'Malley and Miller (LHOM), of which he is a founding partner.

According the firm's website LHOM specializes in providing advice to clients on larger macro political issues trends. "Utilizing our broad experience in California and Washington, D.C., we can furnish 'big picture' analysis of developing political and policy trends which may affect client interests and goals."

What does Miller the Younger bring? Read here: "George Miller brings a lifetime of friendships, relationships, and contacts together with over 15 years of front-line advocacy experience. He's an attorney with expertise that ranges from insurance and banking to transportation, taxation and gaming law," according to the website. "Unlike most advocates, George is at ease working both the corridors of Sacramento power or the halls of Congress."

## **What is the stated purpose of the SunPower's DOE 1705 program loan guarantee?**

SunPower has different lines of business. In addition to manufacturing solar panel and roof tiles, it builds solar panel ranches, which it then sells off, but retains the services contract.

The loan guarantee is earmarked for the job numbers for the California Valley Solar Ranch (CVSR) in San Luis Obispo County, which it has already sold to NRG Solar, but will continue to maintain.

According to the Department of Energy (DOE) website, the CVSR project will create 350 construction jobs during the two-year build and 15 permanent jobs—presumably those are the squeegee men for keeping the panels clean.

*Capitol Hill powerbroker Rep. George Miller (D.-Calif.), center, hosted Interior Sec. Kenneth L. Salazar, left, on an Oct. 14, 2010 tour of SunPower's Richmond, Calif., plant. During the tour, Salazar said plants like SunPower's transform renewable energy ideas into reality. One month later, the company announced it had restated its 2008 and 2009 financial filings to correct for unsubstantiated accounting entries.*

[DOE photo by Tami Heilemann]



If \$80 million per permanent job seems a little high, even for the current Obama administration, you are correct. In addition to the 350 construction jobs and the 15 squeegee men, there will an as-yet-undetermined number of jobs created building the panels for the CVSR—in Mexicali, Mexico.

The company is looking for a facility of up to 320,000 square feet, where it will build three different solar panel models and its solar roof tiles, according the company's Aug. 5 statement.

Marty T. Reese, the company's chief operating officer, said, "Establishing our own manufacturing facility in Mexicali means we will be positioned to quickly deliver our high-efficiency, high-reliability solar products to a growing North American solar market."

Mexicali Mayor Francisco Perez Tejada Padilla said he was thrilled. "Mexicali is rapidly becoming an industrial hub for high-tech companies, offering an educated workforce and a growing manufacturing area," he said. "We welcome SunPower to our city and are pleased that they have chosen Mexicali to establish its solar panel manufacturing facility."

The good news for Mexican jobs seekers did not affect the DOE's loan guarantee to SunPower. Hours before the DOE 1705 loan program expired at the end of Fiscal Year 2011 on Sept. 30, the \$1.2 billion in loan guarantees was approved for the company.

## **Insiders get liquid through for \$1.4 billion friendly buyout from France.**

If that timing seems odd to you, consider the time line of company events around when the loan was announced April 12: just two weeks before France's [Total Oil](#) (TOT-NYSE) launched its friendly

takeover.

The deal, made public April 28, was in effect a 60% buyout at \$23.25, then a 60% premium over the stock's current trading price, which allowed insiders to get liquid.

SunPower CEO Werner is typical of the insiders. On May 24 he exercised his right to purchase 428,343 shares at \$3.30 per share, a \$18 discount from the day's trading range. He sold 478,084 shares June 15, the day the Total Oil takeover closed, at \$23.25 for proceeds of \$11,115,453.

Remember, Total Oil was offering at \$23.25 per share in what was in effect a private sale. The SPWR, Class A or B, shares have not traded above \$23 since June 10, 2010.

### **SunPower is a company in trouble.**

In his Sept. 26 column for [SeekingAlpha.com](http://SeekingAlpha.com), Stoyan Elitzen lists SunPower as the ninth-most-shortest solar stock in either the New York Stock Exchange or NASDAQ markets. Short sellers are betting that a stock price will go down, as opposed to those who buy long, who expect a stock price to up.

According to the Elitzen, the size of SunPower's short position is equal to 15 days of its average daily volume of 725,000 shares per day. By any measure, such pessimism is a banshee screaming in the night for a company's stock price that has already lost 94% of value from its 2007 apex.

Although its stock has recovered from its all-time low Oct. 4 of \$6.60 per share to trade between \$8 and \$9 per share, it has been a steep slide from its all-time high Dec. 3, 2007 of \$133. Then, the company was worth \$13 billion.

Today, its market capitalization is \$800 million, just short of its debt of \$820 billion, according to the company's July filings for the second quarter.

The Oct. 4 sell-off, which gave shareholders a 12% haircut, was triggered by the company's Oct. 3 aftermarket statement announcing the company was paying down its \$50 million credit line with a consortium of European banks and opening a new \$200 million credit line with Deutsche Bank.

According to the statement, Dennis V. Arriola, the company's chief financial officer said the new credit line will improve the company's ability to operate.

“However, the challenging market conditions continue to impact our global residential and commercial business. As a result, we will revise our 2011 revenue and earnings outlook on our third-quarter earnings conference call to be held on Nov. 3,” he said.

As much as Arriola's negative guidance shook up the markets, it also reflects a lesson learned.

In addition to all its other challenges, the company and its officers are defendants in a federal shareholder lawsuit, whose plaintiffs include, the Austin (Texas) Police Retirement System, the Arkansas Teachers Retirement System and a number of institutional investors for an alleged scheme to deceive the investing public by making false statements contrary to nonpublic information known to the insiders.



The allegations cover the period between April 17, 2008, to Nov. 16, 2009, the day the company announced that it had discovered unsubstantiated accounting entries to its operations in the Philippines, which led to the significant restating of the company's financials.

There are a number of lawsuits filed in California courts relating to the same period alleging gross mismanagement, breach of fiduciary responsibility, unjust enrichment and abuse of control.

The first of the lawsuits was filed Nov. 18, 2009, and they have yet to be resolved.

It is a fair question to ask how a company with such serious charges lodged against its management team could receive a \$1.2 billion loan guarantee from the taxpayers, so it could build a new manufacturing plant in Mexico to build the solar panels it will install at a photovoltaic ranch that will create a total of 15 permanent jobs.

Certainly, the time is right for Miller and Miller to clarify their roles in this mess.

**From:** Tom Birmingham

**Sent:** Thursday, October 13, 2011 4:47 PM

**To:** 'Karen Clark'

**CC:** 'Jason Peltier'; 'Tony Coelho'; 'Bernhardt, David L.'; joe.findaro@akerman.com; 'Gayle Holman'; 'Sheila Greene'; 'Ed Manning'; cjensen@ka-pow.com; 'Doug Subers'

**Subject:** Conference Call

I will be traveling in the morning and unable to participate in the call tomorrow morning.

**From:** Jason Peltier  
**Sent:** Wednesday, November 16, 2011 11:27 AM  
**To:** Joe Findaro; David Bernhardt; Dan Keppen  
**Subject:** Dumb move.

## Obama Pushing Shooters Off Public Lands

November 16, 2011 [RSS](#) [Feed](#) [Print](#)

Gun owners who have historically been able to use public lands for target practice would be barred from potentially millions of acres under new rules drafted by the Interior Department, the first major move by the Obama administration to impose limits on firearms.

Officials say the administration is concerned about the potential clash between gun owners and encroaching urban populations who like to use same land for hiking and dog walking.

"It's not so much a safety issue. It's a social conflict issue," said Frank Jenks, a natural resource specialist with Interior's Bureau of Land Management, which oversees 245 million acres. He adds that urbanites "freak out" when they hear shooting on public lands. [[Read about the subpoena issued as a result of Operation Fast and Furious.](#)]

If the draft policy is finally approved, some public access to Bureau lands to hunters would also be limited, potentially reducing areas deer, elk, and bear hunters can use in the West.

Conservationists and hunting groups, however, are mounting a fight. One elite group of conservationists that advises Interior and Agriculture is already pushing BLM to junk the regulations, claiming that shooters are being held to a much higher safety standard than other users of public lands, such as ATV riders.

"They are just trying to make it so difficult for recreational shooters," said Gary Kania, vice president of the Congressional Sportsmen's Foundation. His group is one of several, including the National Wildlife Foundation, Cabela's and Ducks Unlimited, on the Wildlife and Hunting Heritage Conservation Council fighting the new rules. During a two-day meeting ending this afternoon, they are drafting their own changes to the BLM rules.

"What we probably are going to be looking forward to is a reversal," said Kania. Asked about how to handle people who freak out when they hear shots on public lands, Kania said, "I don't know how to quantify 'freaking out,'" and noted that he's seen people panicing when fly fishing in float tubes but nobody wants to ban them from rivers.

BLM actually invited the fight, seeking the council's comments. But officials suggested to Whispers that no changes are being planned to the draft regulations.

Over five pages, the draft BLM regulations raise concerns about how shooting can cause a "public disturbance." They also raise worries about how shooting and shooters can hurt plants and litter public lands.

This is the key paragraph foes say could lead to shooters being kicked off public lands:

"When the authorized officer determines that a site or area on BLM-managed lands used on a regular basis for recreational shooting is creating public disturbance, or is creating risk to other persons on public lands; is contributing to the defacement, removal or destruction of natural features, native plants, cultural resources, historic structures or government and/or private property; is facilitating or creating a condition of littering, refuse accumulation and abandoned personal property is violating existing use restrictions,

closure and restriction orders, or supplementary rules notices, and reasonable attempts to reduce or eliminate the violations by the BLM have been unsuccessful, the authorized officer will close the affected area to recreational shooting." [\[Check out new Debate Club about whether Congress needs to overhaul gun trafficking laws.\]](#)

Squeezing out shooters, says the draft policy, is needed because, "As the West has become more populated, recreational shooters now often find themselves in conflict with other public lands users, and the BLM is frequently called on to mediate these conflicts."

At yesterday's meeting at Interior, the council balked at the BLM draft regulations, adding that the Obama administration was not being fair to shooters on the issue of safety.

In a [draft retort to BLM](#), the council said other users of public land aren't required to be as safe as shooters. They note that shooters have a much lower injury rate than others, like ATV users. "The policy fails to recognize that recreational shooting has one of the lowest incidences of death and injury compared to virtually any other outdoor recreational activity. The policy is prejudicial and discriminatory to target shooters as compared to other recreationists," said the council's draft response, expected to be finalized today.

What's more, the group charged that the BLM is acting in a contradictory fashion, encouraging the shooting sports while limiting shooting areas.

**From:** Serrano, John  
**Sent:** Wednesday, November 30, 2011 11:45 AM  
**To:** Smith, Ryan A.  
**CC:** Bernhardt, David L.; Hrobsky, Jon A.; Craig Manson  
**Subject:** RE: Responses to QFRs

Thanks, Ryan. You have all be a great help!

- John

---

**From:** Smith, Ryan A. [mailto:RSmith@BHFS.com]  
**Sent:** Wednesday, November 30, 2011 1:44 PM  
**To:** Serrano, John  
**Cc:** Bernhardt, David L.; Hrobsky, Jon A.; Craig Manson  
**Subject:** Responses to QFRs

John,

I have attached Judge Manson's responses to the Questions for the Record relating to the hearing held on October 13, 2011, entitled *The Endangered Species Act; Reviewing the Nexus of Science and Policy*.

Should you have any questions, please do not hesitate to contact me.

Ryan A. Smith  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-7353  
T 202.296.7353  
F 202.296.7009

To ensure compliance with requirements imposed by the IRS, we inform you that any federal tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

This transmission and any attachment is attorney privileged and confidential. Any dissemination or copying of this communication is prohibited. If you are not the intended recipient, please notify us immediately by replying and delete the message. Thank you.

**From:** Smith, Ryan A.  
**Sent:** Wednesday, November 30, 2011 12:58 PM  
**To:** Serrano, John  
**CC:** Craig Manson; Bernhardt, David L.  
**Subject:** RE: Responses to QFRs

John,

Thank you for your e-mail. Judge Manson does not have any edits to his testimony.

Ryan

---

**From:** Serrano, John [mailto:John.Serrano@mail.house.gov]  
**Sent:** Wednesday, November 30, 2011 2:27 PM  
**To:** Smith, Ryan A.  
**Subject:** RE: Responses to QFRs

Ryan, I also wanted to check and see if Judge Manson had any edits to his testimony in the hearing record. If so, you can send me them via email by stating the line and page number to be changed. I believe a copy of the transcript was attached to my first email but I have also attached a copy here.

Thanks,  
John

---

**From:** Smith, Ryan A. [mailto:RSmith@BHFS.com]  
**Sent:** Wednesday, November 30, 2011 1:44 PM  
**To:** Serrano, John  
**Cc:** Bernhardt, David L.; Hrobsky, Jon A.; Craig Manson  
**Subject:** Responses to QFRs

John,

I have attached Judge Manson's responses to the Questions for the Record relating to the hearing held on October 13, 2011, entitled *The Endangered Species Act; Reviewing the Nexus of Science and Policy*.

Should you have any questions, please do not hesitate to contact me.

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F 202.296.7009

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**From:** Nelson, Damon

**Sent:** Friday, December 2, 2011 10:16 AM

**To:** Thomas Birmingham (tbirmingham@westlandswater.org); Gary Sawyers (gsawyers@sawyerslaw.com); 'Bernhardt, David L.'

**Subject:** FW: Passcode for Monday's Call?

-----Original Message-----

From: Carpenter.Thomas@epamail.epa.gov [<mailto:Carpenter.Thomas@epamail.epa.gov>]

Sent: Friday, December 02, 2011 12:14 PM

To: Nelson, Damon

Subject: Re: Passcode for Monday's Call?

Thank you for your interest in the December 5, 2011 Environmental Economics Advisory Committee Augmented for the Consideration of the Value of Water to the U.S. Economy teleconference on Estimating the Value of Water in the U.S. Economy. The call is scheduled from 12:30pm to 5pm (EST).

The call-in number is: 866-■■■■-■■■■  
access code 202 ■■■■ ■■■■

Members of the public are invited to listen to the SAB deliberations.

The agenda and meeting materials are available on the SAB web page and may be found at:

[http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr\\_activites/Value%20of%20Water?OpenDocument](http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr_activites/Value%20of%20Water?OpenDocument)

Please click the "advisory meeting and report development" tab at this link:

Regards,  
Tom Carpenter

---

Thomas Carpenter  
Designated Federal Officer  
Science Advisory Board (MC-1400R)  
1200 Pennsylvania Ave, NW  
Washington, DC 20460  
Ph 202-564-4885  
Fax 202-565-2098  
email: Carpenter.thomas @epa.gov

**From:** Tom Birmingham  
**Sent:** Friday, December 2, 2011 5:48 PM  
**To:** 'Bernhardt, David L.'  
**CC:** 'Gary Sawyers'; 'Nelson, Damon'  
**Subject:** FW: Passcode for Monday's Call?

David,  
Will you be able to get on this call on behalf of Westlands?  
Tom

-----Original Message-----

From: Nelson, Damon [<mailto:Damon.Nelson@mail.house.gov>]  
Sent: Friday, December 02, 2011 9:16 AM  
To: Thomas Birmingham (tbirmingham@westlandswater.org); Gary Sawyers (gsawyers@sawyerslaw.com); 'Bernhardt, David L.'  
Subject: FW: Passcode for Monday's Call?

-----Original Message-----

From: Carpenter.Thomas@epamail.epa.gov [<mailto:Carpenter.Thomas@epamail.epa.gov>]  
Sent: Friday, December 02, 2011 12:14 PM  
To: Nelson, Damon  
Subject: Re: Passcode for Monday's Call?

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[http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr\\_activites/Value%20of%20Water?OpenDocument](http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr_activites/Value%20of%20Water?OpenDocument)

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Regards,  
Tom Carpenter

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Thomas Carpenter  
Designated Federal Officer  
Science Advisory Board (MC-1400R)  
1200 Pennsylvania Ave, NW  
Washington, DC 20460  
Ph 202-564-4885  
Fax 202-565-2098  
email: Carpenter.thomas @epa.gov



**From:** Nelson, Damon  
**Sent:** Friday, December 2, 2011 6:24 PM  
**To:** 'tbirmingham@westlandswater.org'; 'DBernhardt@BHFS.com'  
**CC:** 'gsawyers@sawyerslaw.com'  
**Subject:** Re: Passcode for Monday's Call?

David and I talked earlier today. he is going to make sure you guys are covered on the call. I'm going to join too.

-----  
Damon Nelson  
Deputy Chief of Staff & Legislative Director  
Congressman Devin Nunes  
Sent from my BlackBerry Wireless Handheld

----- Original Message -----  
From: Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
Sent: Friday, December 02, 2011 07:48 PM  
To: 'Bernhardt, David L.' <DBernhardt@BHFS.com>  
Cc: 'Gary Sawyers' <gsawyers@sawyerslaw.com>; Nelson, Damon  
Subject: FW: Passcode for Monday's Call?

David,  
Will you be able to get on this call on behalf of Westlands?  
Tom

-----Original Message-----  
From: Nelson, Damon [<mailto:Damon.Nelson@mail.house.gov>]  
Sent: Friday, December 02, 2011 9:16 AM  
To: Thomas Birmingham (tbirmingham@westlandswater.org); Gary Sawyers (gsawyers@sawyerslaw.com); 'Bernhardt, David L.'  
Subject: FW: Passcode for Monday's Call?

-----Original Message-----  
From: Carpenter.Thomas@epamail.epa.gov [<mailto:Carpenter.Thomas@epamail.epa.gov>]  
Sent: Friday, December 02, 2011 12:14 PM  
To: Nelson, Damon  
Subject: Re: Passcode for Monday's Call?

Thank you for your interest in the December 5, 2011 Environmental Economics Advisory Committee Augmented for the Consideration of the Value of Water to the U.S. Economy teleconference on Estimating the Value of Water in the U.S. Economy. The call is scheduled from 12:30pm to 5pm (EST).

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access code 202 ██████████

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[http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr\\_activites/Value%20of%20Water?OpenDocument](http://yosemite.epa.gov/sab/sabproduct.nsf/fedrgstr_activites/Value%20of%20Water?OpenDocument)

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Regards,  
Tom Carpenter

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1200 Pennsylvania Ave, NW  
Washington, DC 20460  
Ph 202-564-4885  
Fax 202-565-2098  
email: Carpenter.thomas @epa.gov

**From:** Bernhardt, David L.  
**Sent:** Tuesday, December 6, 2011 6:53 AM  
**To:** Jason Peltier (jpeltier@westlandswater.org)  
**Subject:** FYI E&E: Calif. Republicans want embattled Interior scientists off fish case

ENDANGERED SPECIES:

## Calif. Republicans want embattled Interior scientists off fish case

Emily Yehle, E&E reporter

Published: Tuesday, December 6, 2011

California Republicans yesterday demanded that Interior Secretary Ken Salazar remove two agency scientists who were harshly criticized by a federal judge for their work on an endangered fish in the state.

The move by Reps. Kevin McCarthy, Ken Calvert, Jerry Lewis, Gary Miller, Devin Nunes and Dana Rohrabacher comes more than two months after a federal judge in California ordered Interior to redo a plan to protect the endangered delta smelt in the Sacramento-San Joaquin Delta. In his ruling, U.S. District Judge Oliver Wanger also lambasted the testimony of two agency scientists as "false" and "outrageous" (*E&ENews PM*, Sept. 20).

Those findings should "have been a wake-up call to the Department," the lawmakers wrote in their [letter](#) to Salazar.

"It is imperative that the new delta smelt biological opinion be clearly grounded in the best available science, not just the best science the federal agencies have to offer," they wrote. "Credibility of a new delta smelt biological opinion rests on a credible process, and again using the same compromised scientists and their teams to develop this opinion runs counter to a fair and impartial implementation of ESA."

The original 2008 plan, or biological opinion, concluded that water flowing to irrigating districts and farms in the Central Valley has to be reduced in order to protect the tiny fish. McCarthy has opposed the plan because of the potential effect on local businesses and farms. A spokeswoman said yesterday that he drafted the letter to Salazar after talking to officials at the Kern County Water Agency's 50th anniversary in October.

The lawmakers allege that the Fish and Wildlife Service and the Bureau of Reclamation "have acted in an unlawful and dishonest manner at the expense of our constituents by denying them the water they contract for, pay for, and so desperately need."

"You have an opportunity to restore the damaged credibility of the Department of the Interior, FWS, and BoR," they wrote. "Strengthening the re-consultation process through new and impartial scientists and improving the scientific expertise involved (including supplementing it with expertise developed outside of Federal agency service) is an important first step to ensure the new delta smelt biological opinion is based on the best available science."

Wanger's August ruling dealt with Fish and Wildlife Service's justification for water-pumping cutbacks to the delta, but it was his comments about the two scientists that received the most media attention. Although he

never accused them of scientific misconduct, Wanger called FWS scientist Jennifer Norris a "zealot" and Frederick Feyrer of the Bureau of Reclamation "untrustworthy as a witness."

Wanger's comments have added a new battle to the war over the delta's waters, becoming ammunition for groups criticizing the Endangered Species Act. Wanger, who retired shortly after the ruling, has also come under fire for his new private-sector job: an attorney at a Fresno firm, where he is now representing the Wetlands Water District in a case over whether their interim water contracts violate state environmental law.

Interior officials have stood by the work of Norris and Feyrer, though the agency has hired independent experts to evaluate Wanger's allegations, as called for under its scientific integrity policy. Gary Frazer, FWS assistant director of endangered species, said at a hearing in October that officials disagree with Wanger and called the independent review "standard procedures."

Yesterday, Interior spokesman Adam Fetcher reiterated Interior's support of the science behind the delta smelt plan.

"We firmly believe that wise decisions about the future of the Bay Delta must be guided by the best available science, and we have not wavered in our commitment to addressing California's complex water problems with science-based solutions," he said in an email. "We stand behind the consistent and thorough work of our scientists over many years, and their expertise and professionalism remain vital to the success of our efforts to meet the co-equal goals of improving water reliability and restoring the health of the Bay Delta."

**From:** Bernhardt, David L.  
**Sent:** Thursday, December 8, 2011 9:51 PM  
**To:** Craig Manson  
**Subject:** Re: FYI: FWS defining "significant portion of its range."

Thanks Craig

David Bernhardt  
[REDACTED]

On Dec 8, 2011, at 8:54 PM, "Craig Manson" <[cmanson@westlandswater.org](mailto:cmanson@westlandswater.org)> wrote:

---

**From:** Tanya.Dobrzynski [<mailto:Tanya.Dobrzynski@noaa.gov>]  
**Sent:** Thursday, December 08, 2011 9:29 AM  
**To:** Tanya Dobrzynski  
**Subject:** NOAA, USFWS File Joint Policy to Improve ESA Implementation

Good morning,

Please see the below press release and the attached joint filing by NOAA's National Marine Fisheries Service and the U.S. Fish and Wildlife Service describing a proposed policy to improve implementation of the Endangered Species Act by defining the phrase "significant portion of its range," which will help guide listing decisions for threatened or endangered species.

Please let me know if you have any questions.  
Tanya

<(null)>

### **U.S. Fish and Wildlife Service and NOAA's Fisheries Service Propose Policy to Improve Implementation of Endangered Species Act**

A new federal policy proposed today will help clarify which species or populations of species are eligible for protection under the Endangered Species Act and will provide for earlier and more effective opportunities to conserve declining species.

The public is invited to comment on the policy, proposed by the Interior Department's U.S. Fish and Wildlife Service (FWS) and NOAA's National Marine Fisheries Service (NOAA Fisheries), the two federal agencies responsible for administering the Endangered Species Act (ESA). Comments will be accepted for the next 60 days.

The proposed policy will define the key phrase “significant portion of its range” in the ESA and provide consistency for how it should be applied, aiding the agencies in making decisions on whether to add or remove species from the federal list of threatened and endangered wildlife and plants. The phrase is not defined in the ESA, but appears in the statutory definitions of “endangered species” and “threatened species” in the ESA.

The policy would clarify that the FWS and NOAA Fisheries could list a species if it is endangered or threatened in a “significant portion of its range,” even if that species is not endangered or threatened throughout all its range. Under the proposed policy, a portion of the range of any given species would be defined as “significant” if its contribution to the viability of the species is so important that, without that portion, the species would be in danger of extinction. While the services expect this circumstance to arise infrequently, this policy interpretation will allow ESA protections to help species in trouble before large-scale decline occurs throughout the species’ entire range.

“This proposed interpretation will provide consistency and clarity for the services and our partners, while making more effective use of our resources and improving our ability to protect and recover species before they are on the brink of extinction,” said Fish and Wildlife Service Director Dan Ashe. “By taking action to protect imperiled native fish, wildlife and plants, we can ensure a healthy future for our communities and protect treasured landscapes for future generations.”

“A clear and consistent policy will help our partners and improve the process of evaluating species status under the Endangered Species Act,” said Eric Schwaab, NOAA’s Assistant Administrator for Fisheries.

Uncertainty about the meaning of this important phrase has led to debate and litigation. A formal opinion developed by the Solicitor of the Department of the Interior (known as the “M-Opinion”) had been applied by the FWS since March 16, 2007. But the M-Opinion was withdrawn on May 4, 2011, after two courts rejected key aspects of it. NOAA Fisheries has never applied the FWS interpretation, nor did it issue separate guidance, instead relying on a general understanding similar to the policy interpretation in today’s proposal.

This proposed policy differs substantially from the DOI’s M-Opinion interpretation. Today’s proposal requires that if a species is found to be threatened or endangered in a significant portion of its range, the entire species must be listed and protections of the ESA applied throughout its range. However, if the significant portion of the range is the exact same area inhabited by a “distinct population segment” of the species, only the distinct population segment would be listed. A distinct population segment is a vertebrate animal population or group of populations that is discrete from other populations of the species and significant to the overall species.

In contrast, under the M-Opinion, only individuals of a species found within the “significant portion of its range” were protected under the ESA. Today’s proposed policy also establishes a more specific and stringent standard to evaluate whether a portion of a species’ range would be considered “significant” than the standard applied under the M-Opinion interpretation. This higher bar will ensure that the species being evaluated for ESA protection on the basis of threats to only a significant portion of its range are truly in need of conservation.

Before finalizing the policy, FWS and NOAA are seeking public comments on the proposal for 60 days beginning on the date of the proposed rule’s publication in the *Federal Register*. All

comments will be posted on <http://www.regulations.gov>. You may submit written comments and information through:

Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the instructions for submitting comments to Docket No. [FWS–R9–ES–2011–0031]; or

U.S. mail or hand delivery: Public Comments Processing, Attn: [FWS–R9–ES–2011–0031]; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

Until the policy is final, FWS and NOAA Fisheries have an obligation to meet statutory timeframes and make determinations in response to petitions to list, reclassify, and delist species. During this interim period, FWS and NOAA Fisheries will consider the interpretations and principles in this proposed policy as nonbinding guidance in making individual listing determinations. As nonbinding guidance, FWS and NOAA Fisheries will apply these interpretations and principles only as the circumstances warrant, and the agencies will independently explain and justify any decision made in this interim period in light of the circumstances of the species under consideration. In preparing a final policy, FWS and NOAA Fisheries will consider all comments and information received during the comment period on this proposed policy, as well as experience gained during the interim period.

America's fish, wildlife and plant resources belong to all of us, and ensuring the health of imperiled species is a shared responsibility. To learn more about the FWS Endangered Species program, go to <http://www.fws.gov/endangered/>.

*NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Visit us at <http://www.noaa.gov> or on Facebook at <http://www.facebook.com/usnoaagov>. To learn more about the NOAA Fisheries Endangered Species program, go to <http://www.nmfs.gov/pr>.*

*The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. We are both a leader and trusted partner in fish and wildlife conservation, known for our scientific excellence, stewardship of lands and natural resources, dedicated professionals, and commitment to public service. For more information on our work and the people who make it happen, visit [www.fws.gov](http://www.fws.gov). Connect with our Facebook page at [www.facebook.com/usfws](http://www.facebook.com/usfws), follow our tweets at [www.twitter.com/usfwshq](http://www.twitter.com/usfwshq), watch our YouTube Channel at <http://www.youtube.com/usfws> and download photos from our Flickr page at <http://www.flickr.com/photos/usfwshq>.*

# # #

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Tanya Dobrzynski  
NOAA Office of Legislative and Intergovernmental Affairs  
14th and Constitution Ave., NW  
Washington, DC 20230  
Direct line (office): 202-482-7940  
Main line (office): 202-482-4981  
Cell: 240-████-████  
Fax: 202-482-4960



<image001.gif>



**From:** Jason Peltier

**Sent:** Friday, December 16, 2011 11:46 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** is this the "new way" to get projects done in Congress?

Keystone may end up in payroll deal

By: Jake Sherman and Manu Raju

December 16, 2011 09:43 AM EST

Congressional negotiators are seriously considering including the Keystone XL oil pipeline as part of a package that would extend a payroll tax holiday for a full year, several people familiar with talks said Friday.

In closed-door negotiations, Democrats are pushing Republicans to soften the language on the pipeline and are trying to win other GOP concessions on a plan that would also extend jobless benefits through next year. The White House will make the final call on what it would be willing to accept, sources say.

Republicans say they're not budging on the pipeline.

Senate Minority Leader Mitch McConnell "will not support any bill without the Keystone XL language as part of the agreement," his spokesman Don Stewart said Friday.

A bill passed by the House this week calls on the administration to make a decision on permitting the pipeline within 60 days. But the president could decide against it if he "determines that the Keystone XL pipeline would not serve the national interest," a decision fraught with political risks in the thick of an election year.

The 1,700-mile pipeline, which would extend from Canada to the Gulf Coast, has generated heated debate between environmental groups and industry officials over the last several months. The administration has said it would review the proposed route, a move that would put off a decision until after the 2012 elections.

Senate negotiators were expected to make an announcement on a deal later this afternoon that would extend the payroll tax holiday that would affect millions of workers in the new year, a top priority for the White House.

But they were still finalizing the details on how to pay for the \$120-billion cost of the payroll tax break, \$40 billion for jobless benefits, and \$21 billion for changing how physicians who service Medicare patients are reimbursed. A separate package worth up to \$35 billion to extend a host of expiring tax breaks may also be tacked on.

The Keystone provision is among the most controversial items in the package.

House Republican leaders intensified pressure on the Senate Friday to attach the controversial Keystone pipeline provision to a package extending the payroll tax break, a move that came as Senate negotiators revived talks over a long-term year-end deal.

Speaker John Boehner told a closed meeting of the House Republican Conference on Friday morning that he's hunkering down on the pipeline provision in legislation to extend the tax holiday, jobless benefits and the Medicare reimbursement rate.

At the meeting in the Capitol, the Ohio Republican said if the Senate sends the lower chamber a two-month extension of jobless benefits, the payroll tax holiday, and the Medicare reimbursement rate for physicians, "we'll amend it and send something back."

"And what we send back will include Keystone," Boehner said to applause, according to two sources in the room.

But Senate negotiators - who had floated the idea of a two-month extension Thursday night — are now focused on a full-year extension, ensuring the issue won't emerge again until after the November 2012 elections.

As House Majority Leader Eric Cantor of Virginia and other top House Republicans began to voice concerns about a short-term extension, there were expectations that Democrats could accept the pipeline provision if it were part of a sweeping year-long deal.

But the talks in the Senate were still ongoing.

"We're making really good progress on being able to handle the issues that everyone knows are outstanding," Senate Majority Leader Harry Reid (D-Nev.) said on the floor. "We're not there yet, but we're very, very close."

Senate Minority Leader Mitch McConnell (R-Ky.) added the two men are making "significant progress" on reaching a deal that would have bipartisan backing. "I think we're going to get to that place," he said.

Reid and McConnell didn't lay out what would be in their proposal, but they indicated votes would be held in a rare Saturday session. Moreover, they said the Senate may vote Saturday to fund the government through next fall and added that the White House has determined that agencies will not shutdown even if funding legislation slips past the Friday deadline and into the weekend.

Despite the upbeat rhetoric, there could still be some pre-Christmas drama on the Keystone issue, given the White House's initial opposition to including the language in a deal that would give a 4.2 percent Social Security tax break to 160 million workers. If Congress fails to act, many families could pay about \$1,000 more annually in the payroll tax.

In a bill to extend jobless benefits and the payroll tax break, the House added a provision calling for the Obama administration to make a decision within 60 days on whether to permit construction of the Keystone oil pipeline, which would extend from Canada to the Gulf Coast. The State Department has been doubtful whether it would be able to make such a decision within that timeframe.

Senate Democrats didn't outright reject the Keystone idea on Friday morning.

Asked about Boehner's comments, Senate Majority Whip Dick Durbin (D-Ill.) said tersely: "It's time for conversations to get beyond the press and in between the leaders."

Senate leaders hoped to get a deal on a year-long proposal, but weren't ruling out a two-month deal as a fallback plan.

On Friday, Boehner didn't indicate that he's fully opposed to the short-term extension Reid and Senate Republicans are eying. Senate Democrats say it's a fallback measure that would kick the decision into early next year, as the two sides are at loggerheads over a year-long extension of the policies. The short-term bill would cost roughly \$40 billion.

But several House Republicans were cool on the two-month extension in conversations Friday morning. They are afraid of extending the debate into 2012, when Obama is in campaign mode. Top Republican aides said flatly Friday morning that a two-month extension will not pass the House.

Meeting with Boehner Friday morning, Cantor, Majority Whip Kevin McCarthy of California and Republican Conference Chairman Jeb Hensarling of Texas said that they were concerned about a two-month package and were unlikely to support it.

Boehner didn't signal immediate opposition, but refused to address the merits of a short-term extension.

"The House has done its work, we're waiting on the United States Senate," Boehner told reporters Friday. "But these rumors that are floating around here about a two-month extension, I'll just say this: if that bill comes over to us, we will make changes to it, and I will guarantee you that the Keystone pipeline will be in there when it goes back to the United States Senate."

Pressed further about what he thinks about a two-month extension, he snapped back, declining to answer.

"I just gave you an answer," the speaker said. "How much clearer can I be?"

Boehner also said he was sending the House home Friday for the weekend, and "if there's a need to come back to finish our work, we will do so."

**From:** Jason Peltier

**Sent:** Friday, December 16, 2011 4:00 PM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Dave's Ppt

**Attachments:** 12132011 Bay\_Delta 4b Presentation.pdf

This is great stuff!

-----Original Message-----

From: Arakawa,Stephen N [<mailto:sarakawa@mwdeh2o.com>]

Sent: Friday, December 16, 2011 2:19 PM

To: Jason Peltier; Brent Walthall; LauraK@swc.org; Jon Rubin (JRubin@Diepenbrock.Com); 'Byron Buck'; Valerie Connor; Ara Azhderian; Cindy Kao; Masouredis, Linus S; Sheehan,Rebecca D; Simonek,Laura J; Terry Erlewine; Burman,Brenda W

Cc: Patterson,Roger K; Fullerton,David K

Subject: FW: Dave's Ppt

Here is Dave Fullerton's presentation to our board committee this week on latest nutrient paper and relationships with food chain.

Stephen N. Arakawa

Manager, Bay-Delta Initiatives  
Metropolitan Water District of Southern California  
700 North Alameda Avenue  
Los Angeles, California 90012  
Office: (213) 217-6052

-----Original Message-----

From: Jason Peltier [<mailto:jpeltier@westlandswater.org>]

Sent: Friday, December 16, 2011 10:12 AM

To: Arakawa,Stephen N

Subject: Dave's Ppt

Could you circulate Fullerton's PowerPoint from this week in LA on Glibert's paper and relationships?

This communication, together with any attachments or embedded links, is for the sole use of the intended recipient(s) and may contain information that is confidential or legally protected. If you are not the intended recipient, you are hereby notified that any review, disclosure, copying, dissemination, distribution or use of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately by return e-mail message and delete the original and all copies of the communication, along with any attachments or embedded links, from your system.



# **New Science Developments**

## **Effects of Nutrient Imbalances on the Bay-Delta Food Web**

**Special Committee on Bay-Delta**  
**Item 4-b, December 13, 2011**

# New Science Developments

## Board Briefings

- Mar 2011 – New Fishery Detection Methods
- Apr 2011 – Lifecycle Modeling
- Jun 2011 – Relevance of X2 to Fish Requirements
- Dec 2011 – Effects of Nutrient Imbalances on the Food Web



# Research Authors

- Dr. Pat Glibert  
*University of Maryland (main author)*
- Dr. Joann M. Burkholder  
*North Carolina State University*
- Dr. Jeffrey C. Cornwell  
*University of Maryland*
- Dr. Todd M. Kana  
*University of Maryland*
- David Fullerton  
*MWD of Southern California*



# Dr. Pat Glibert

- Professor, University of Maryland Center for Environmental Science
- Global symposia co-convenor
  - Victoria, Canada—Limnology conference
  - Nha Trang, Vietnam—Asian GEOHAB conference
  - Woods Hole, MA, United States—Symposium on Harmful Marine Algae
  - Others
- Estuary Research
  - Australia (Moreton Bay)
  - Baltic Sea (Gulf of Riga)
  - Brazil (South Atlantic/Coastal Waters)
  - China (East China Sea)
  - Kuwait (Arabian Sea and Kuwait Bay)
  - Others





# Overview of Conclusions

- Nitrogen (N) and phosphorus (P) are nutrient foundations of any ecosystem
- As N&P ratios shift, ecosystems can shift
- Ratios have shifted since 1980s
- Pelagic Organism Decline may be related to changing N&P ratios



Nitrogen



Phosphorus

# Bay-Delta Ecosystem Changes

1980 - 2011



Eurytemora



Limnoithona

- ↑ Clams
- ↓ Diatoms and chlorophyll
- ↓ Summer/fall turbidity
- ↓ *Eurytemora*, high value food
- ↑ *Limnoithona*, low value food
- ↑ Toxic Algae
- ↑ Submerged plants (SAV)
- ↑ Predator Fish (Bass, etc)
- ↓ Pelagic fish

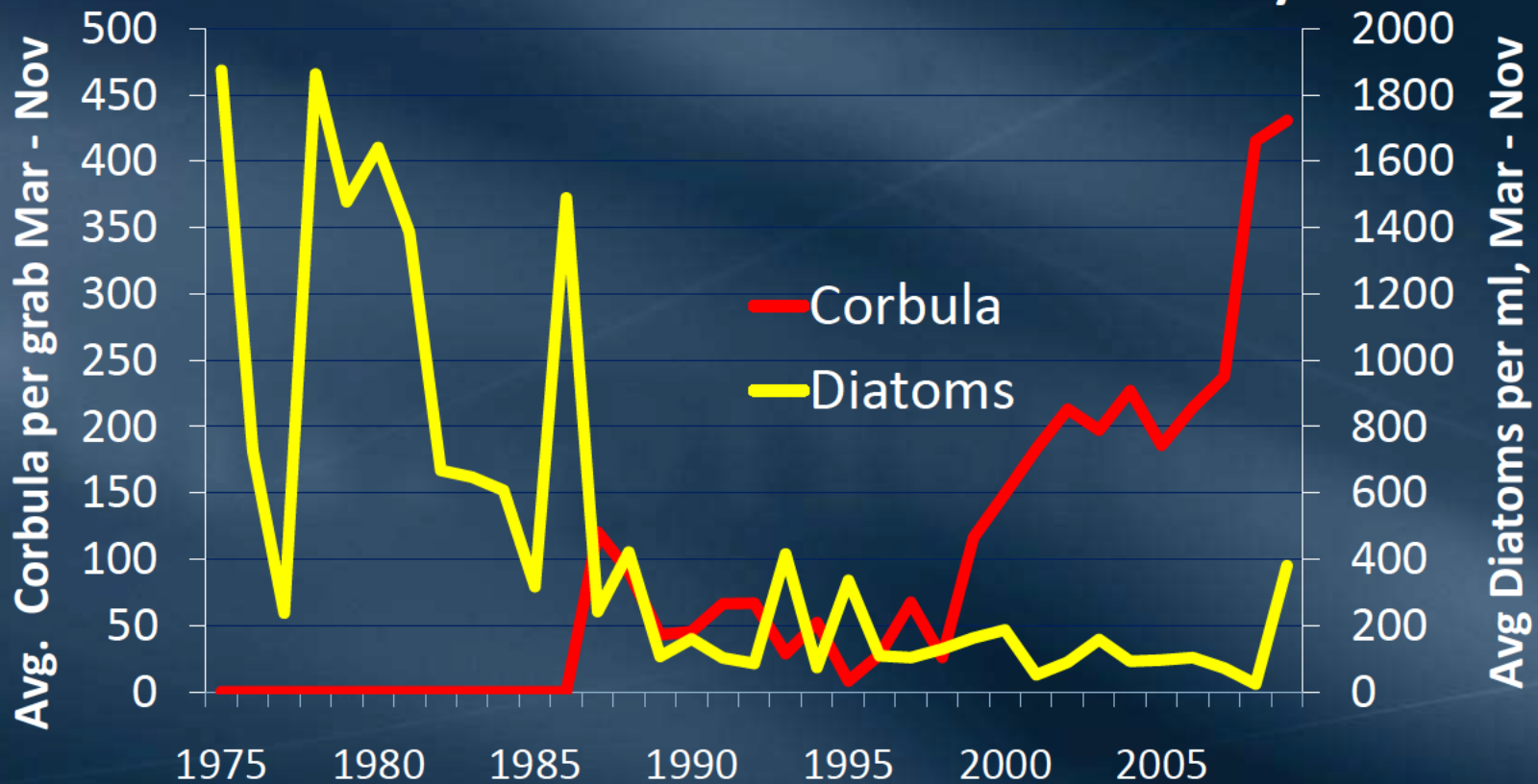


*Corbula amurensis*  
(Overbite clam)

# Bay-Delta Ecosystem

## 1980 - 2011

### Corbula and Diatoms in Suisun Bay





Eurytemora

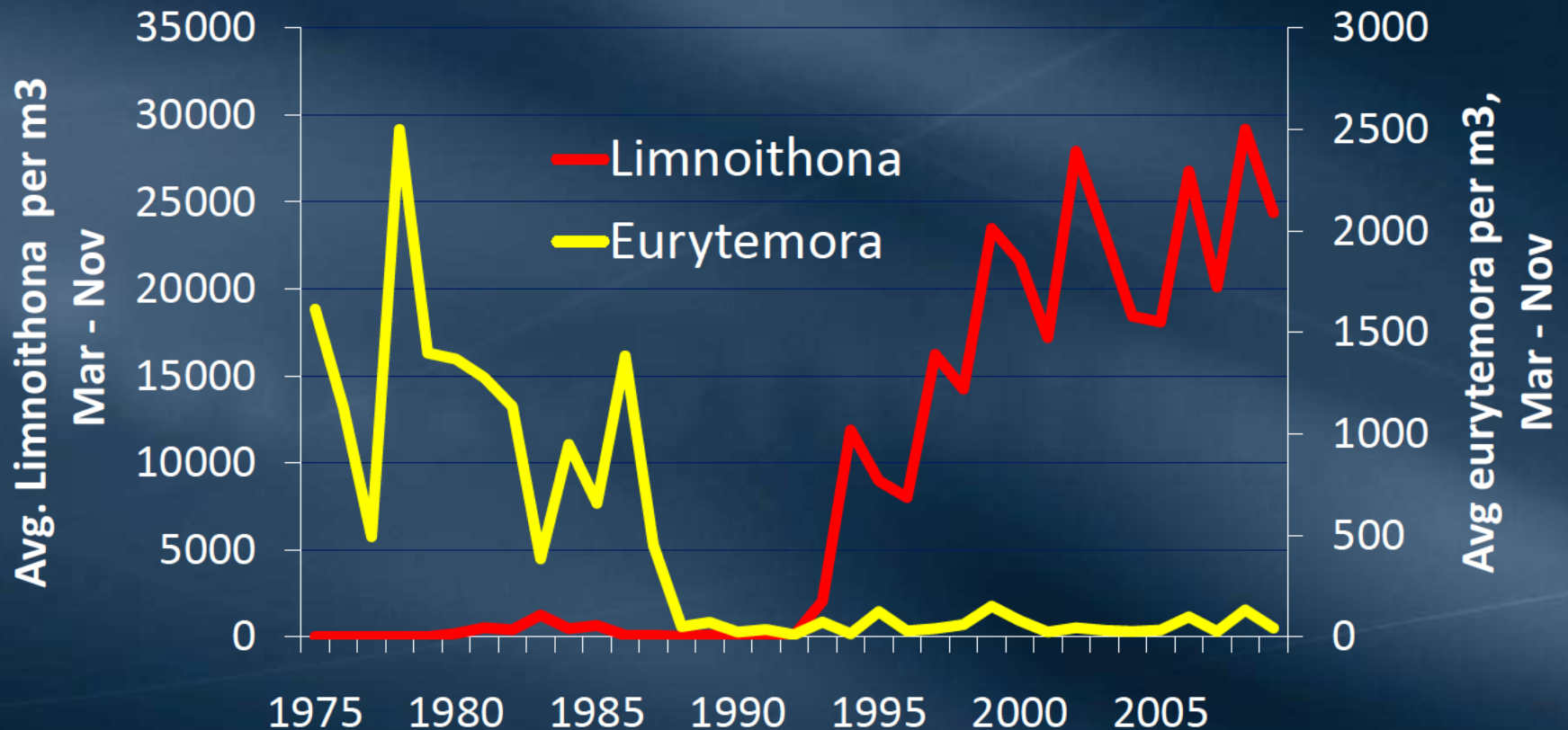
# Bay-Delta Ecosystem

## 1980 - 2011



Limnoithona

### Limnoithona and Eurytemora in Suisun Bay





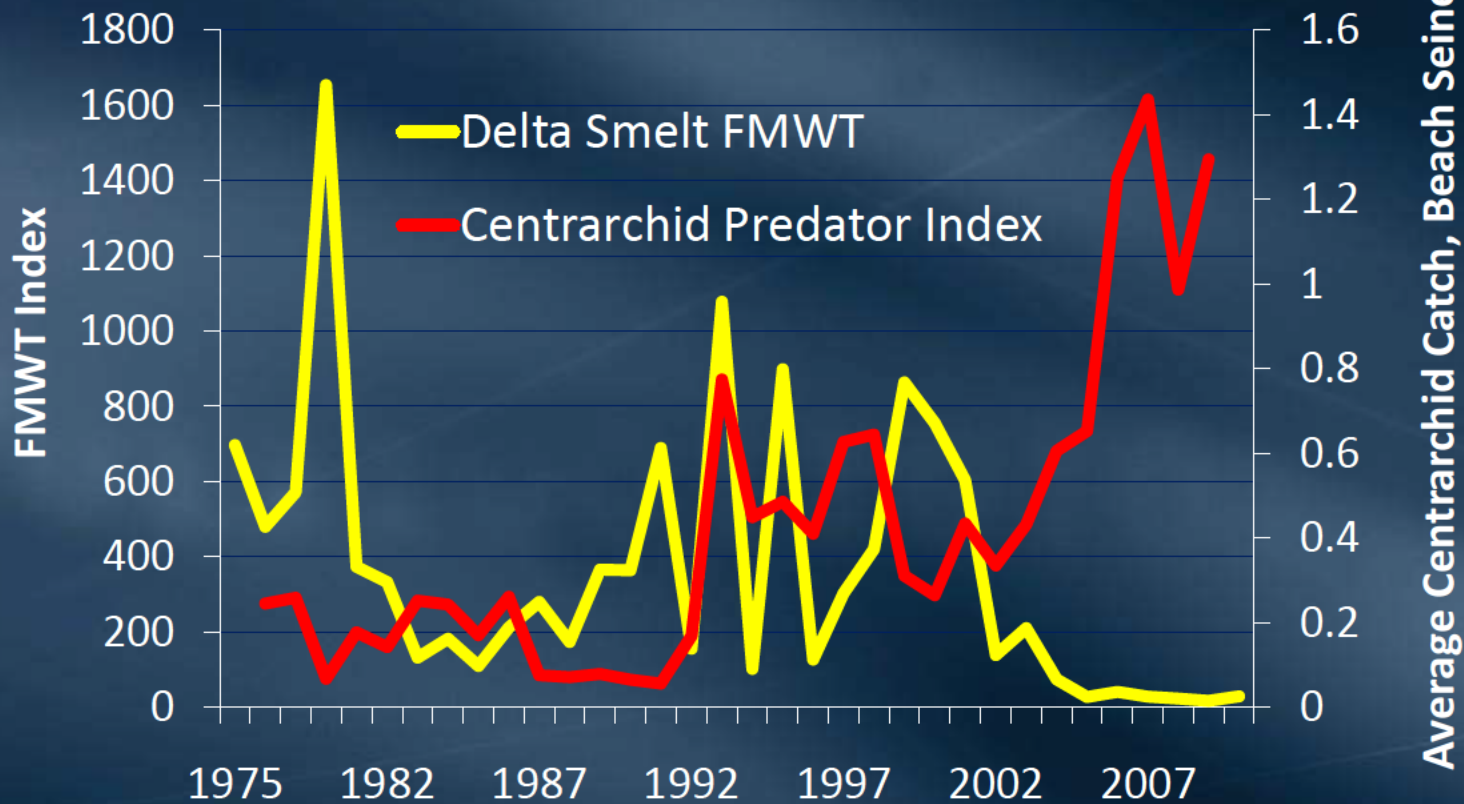


# Bay-Delta Ecosystem

## 1980 - 2011



Centrarchid Predator Index and  
Delta Smelt Fall Abundance



# Ecosystem Theories

- Water projects
- 150 years of development/stressors
- Nutrient shifts

# Global Phenomenon

## Phosphorus/Nitrogen Imbalance

- Potomac River, USA
- Chesapeake Bay, USA
- Neuse Estuary, North Carolina
- Florida Bay, USA
- Lake Washington, USA
- Hudson River, USA
- Ebro River, Spain
- Baltic Sea, Sweden
- Moreton Bay, Australia

# 150 Years of Development & Stressors

*“The pelagic organism decline represents a rapid ecological regime shift that followed a longer-term erosion of ecological resilience...We now have evidence that all investigated drivers may have played a role in the decline”*

- Outflow
- Landscape
- Turbidity
- Contaminants
- Salinity Gradient
- Temperature
- Nutrients
- Harvest



# The Predictable Result of Nutrient Imbalances?

N&P ratio has changed dramatically since the 1970s

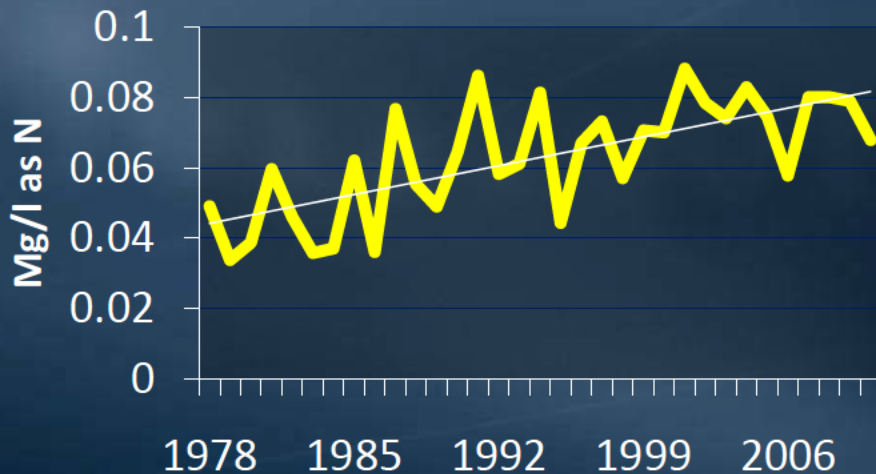
Dissolved Inorganic Nitrogen/  
Dissolved Inorganic Phosphorus



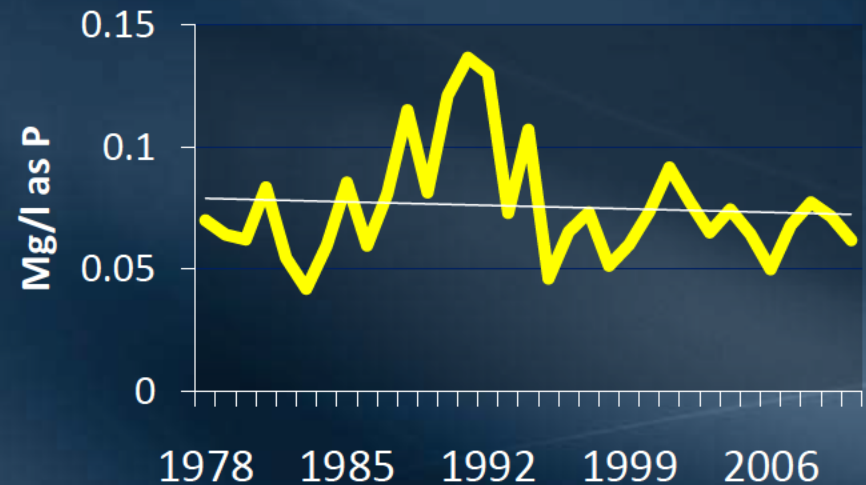
# Why has Nitrogen-Phosphorus Ratio Changed?

- Elimination of phosphate in detergents ~ early 1990s
- Increased loading of ammonium from wastewater
- Fertilizers

**Ammonium in Suisun Bay**



**Phosphate in Suisun Bay**



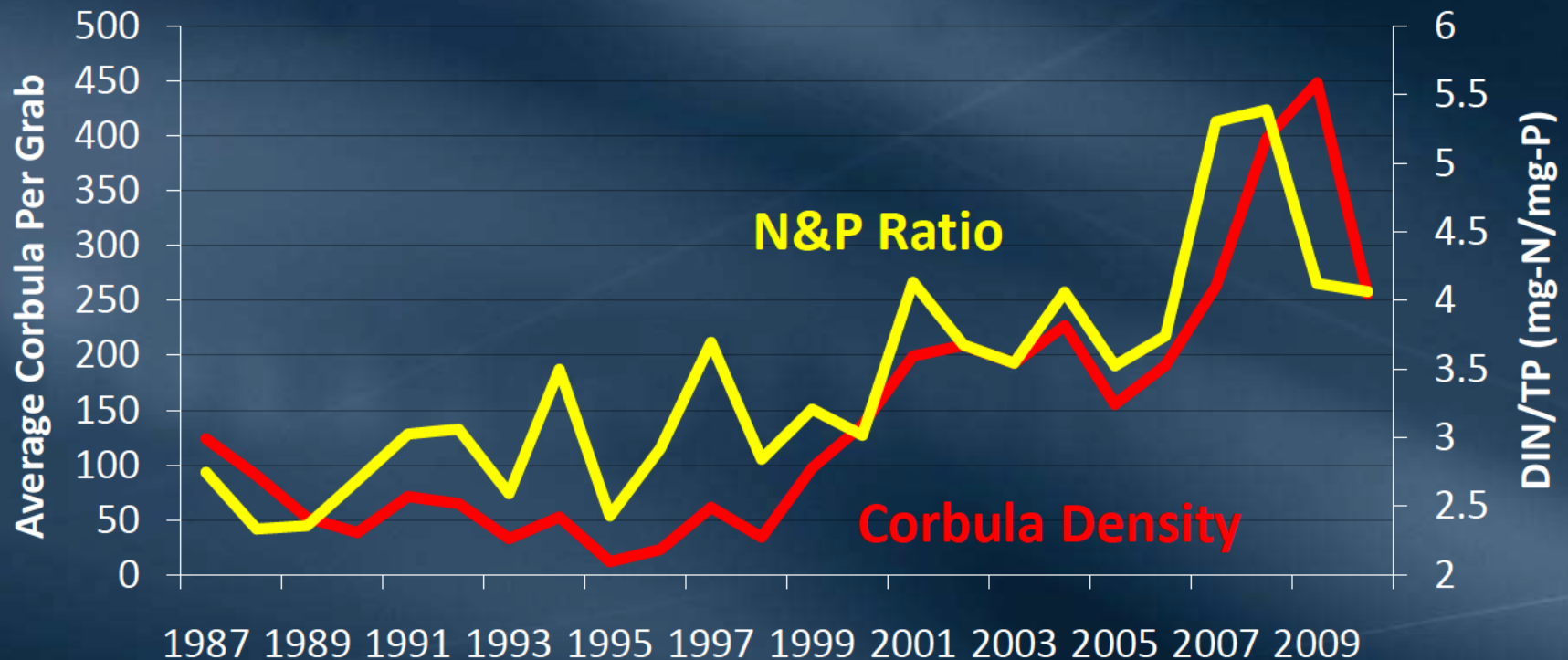
# How do Nitrogen-Phosphorus Ratios Impact the Food Web?

- Different species get a competitive edge
- Phosphate specialists – hoarders such as clams and predators – do well
- Native species of concern do poorly

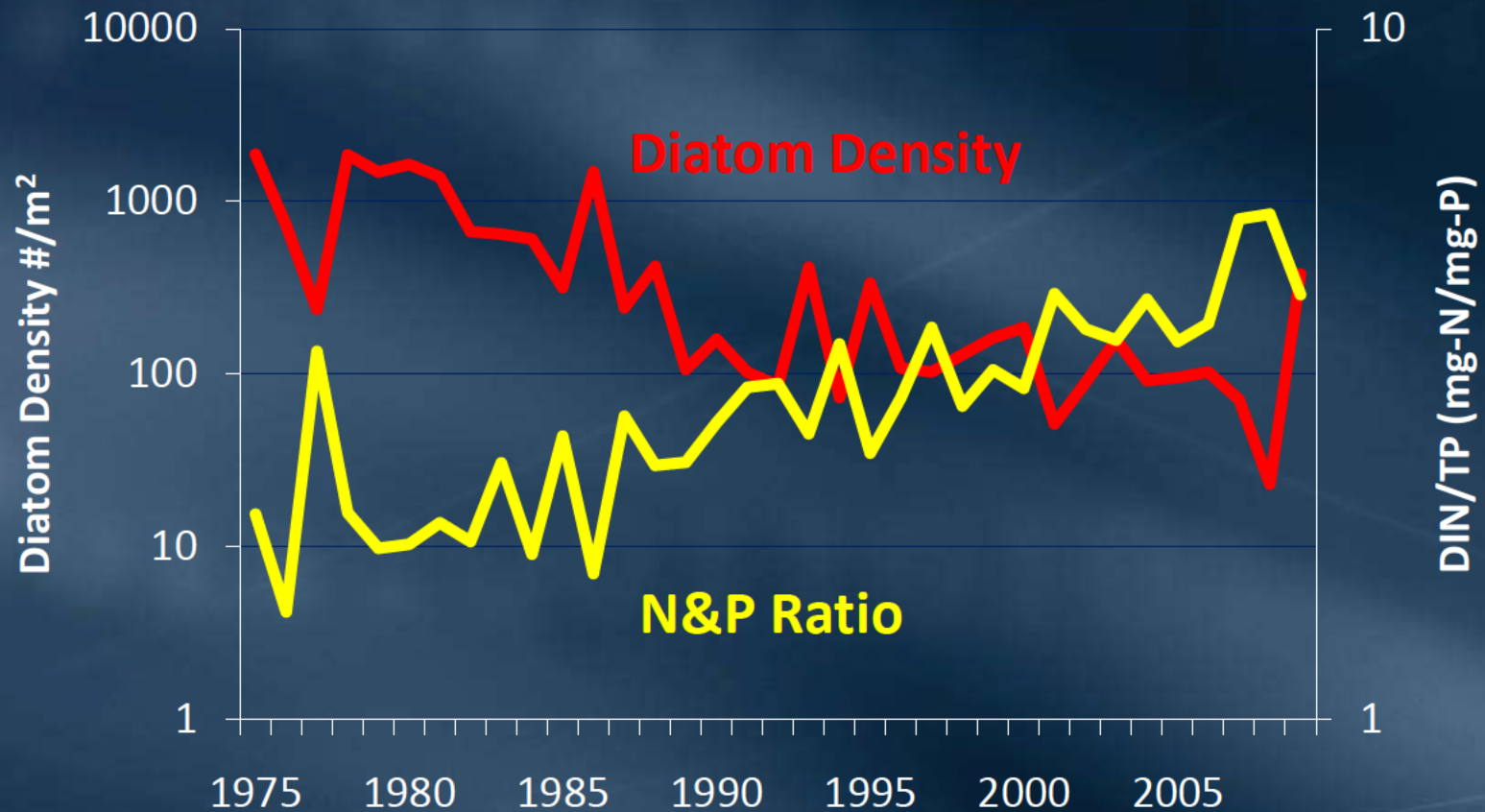


*Corbula amurensis*  
(Overbite clam)

# Historical Data Support Nitrogen-Phosphorus Relationships



# Historical Data Support Nitrogen-Phosphorus Relationships

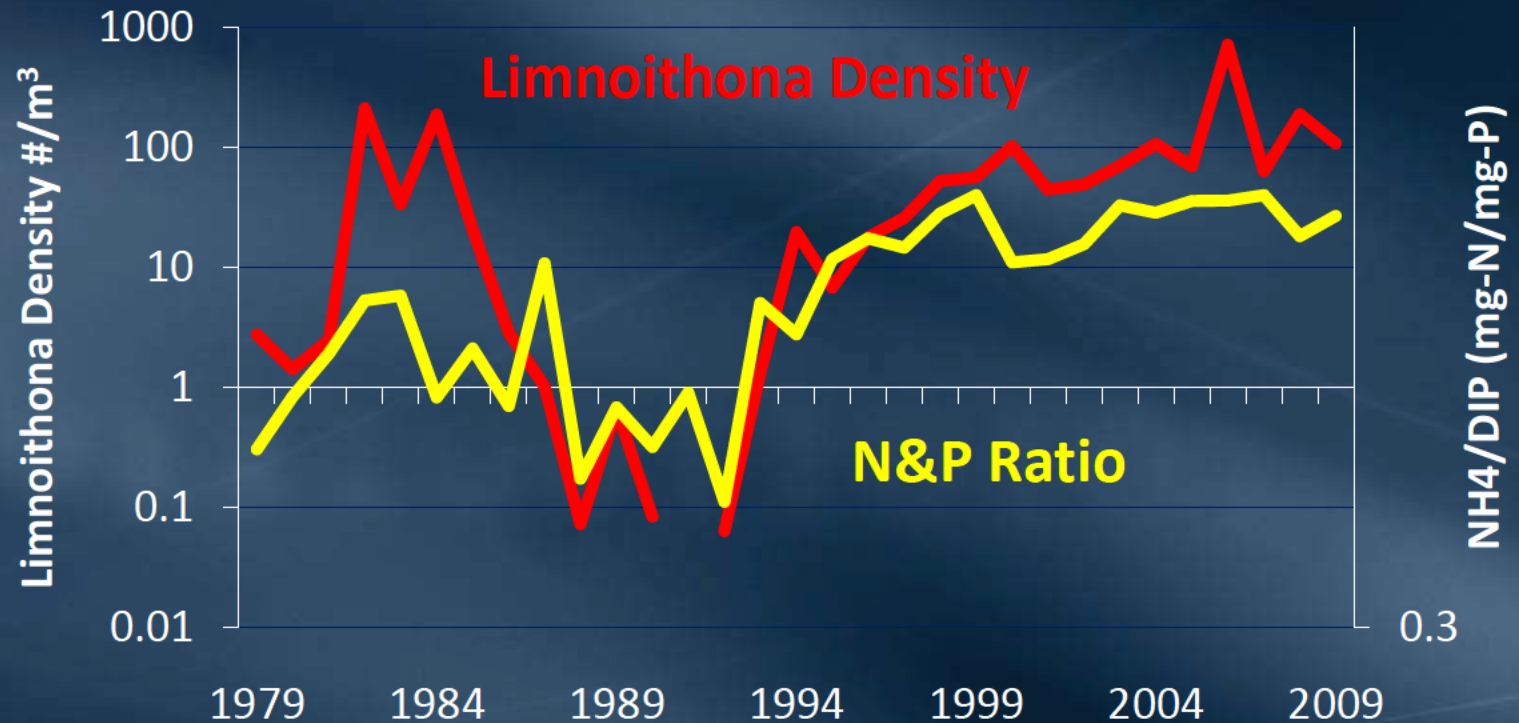






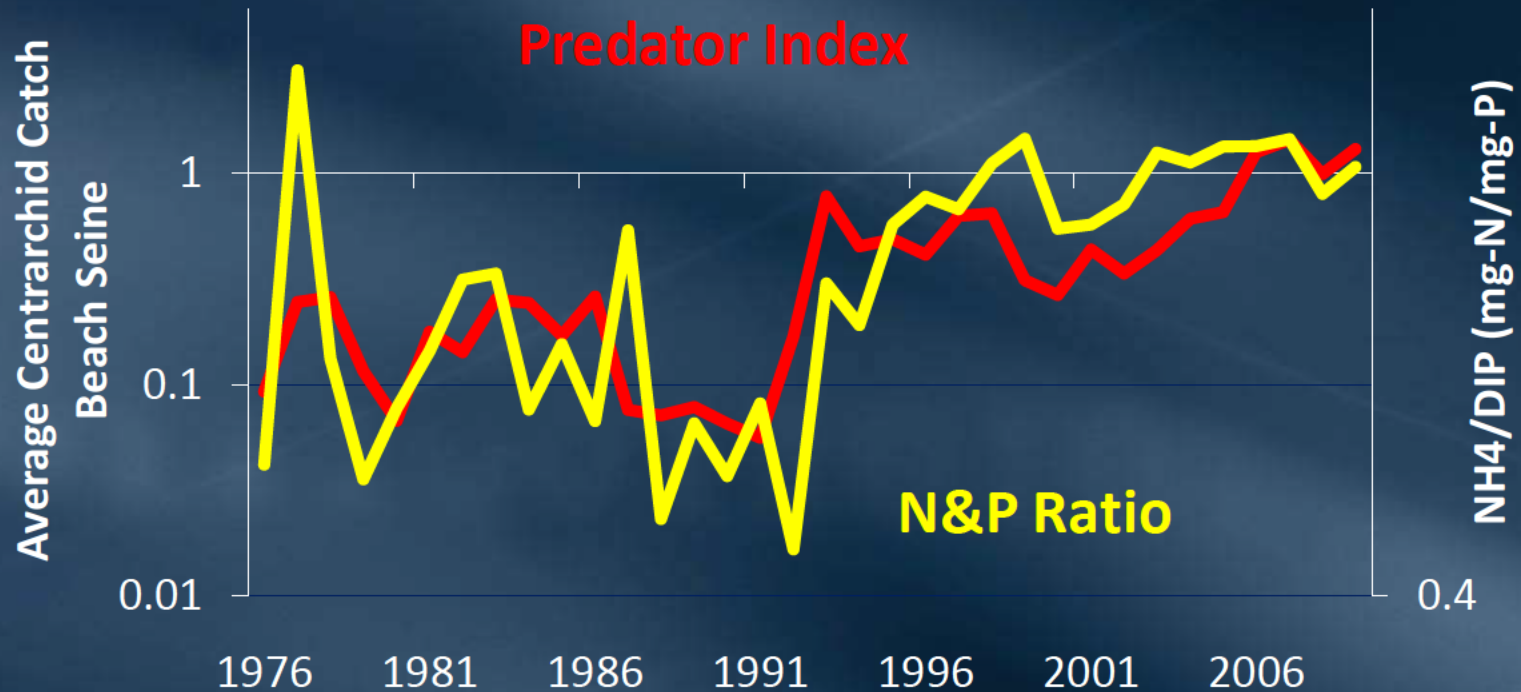
Limnoithona

# Historical Data Support Nitrogen-Phosphorus Relationships



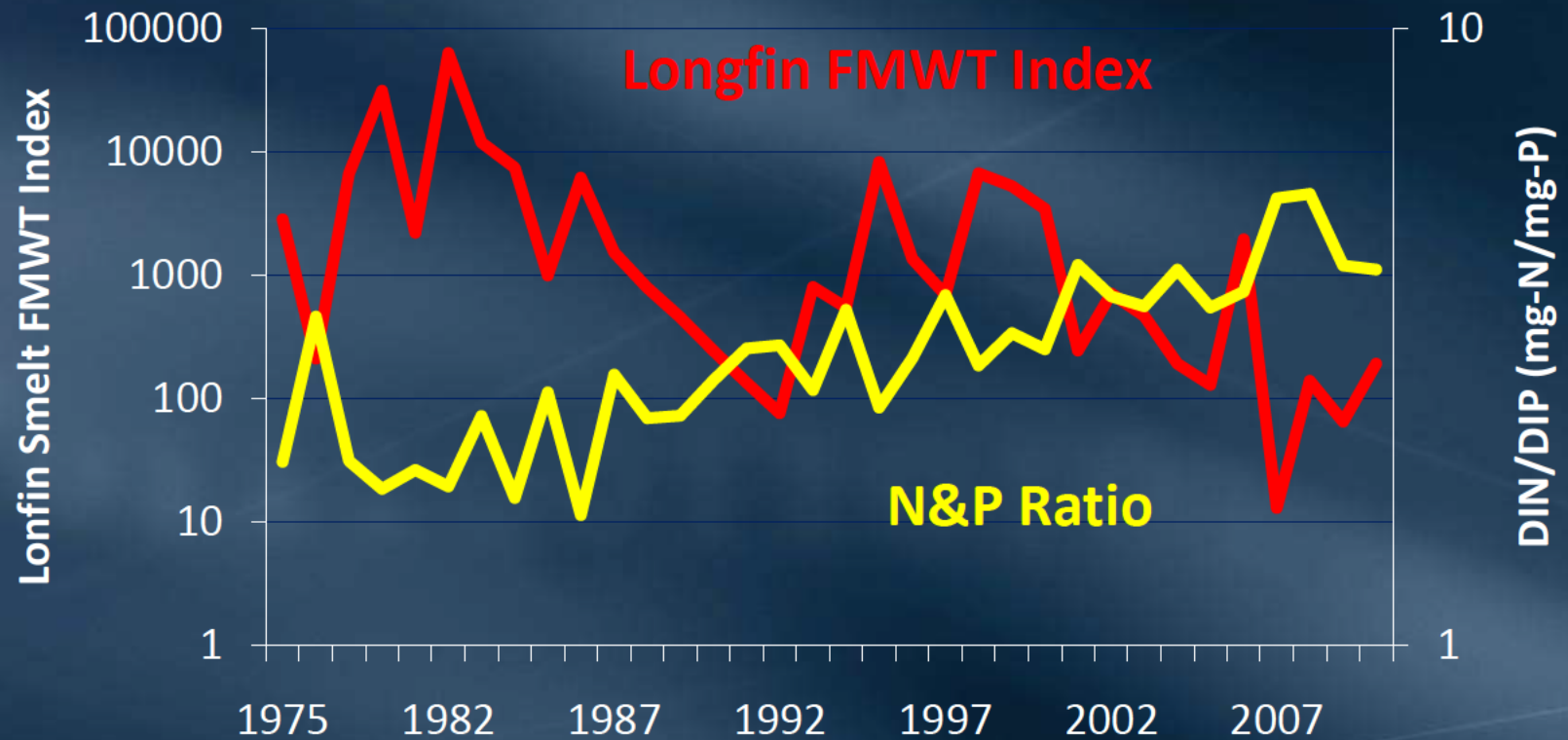


# Historical Data Support Nitrogen-Phosphorus Relationships





# Historical Data Support Nitrogen-Phosphorus Relationships





# Conclusions / Next Steps

- Reduction in Nitrogen could provide significant benefit
- Second nutrient paper published in *Reviews in Fisheries Science* in October 2011
- Dr. Glibert, Dr. Dugdale, et al conducting field work to test nutrient theory
- Sponsor international conference



# The Delta

**Suisun Bay**

**Sacramento**

**Stockton**

**State & Federal  
Pumping Plants**

*California's Bay-Delta*

**From:** Jason Peltier

**Sent:** Thursday, December 22, 2011 11:29 AM

**To:** T Birmingham (tbirmingham@westlandswater. org); Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** San Joaquin County Delta Stakeholders Coalition

I had not seen this.... We can agree with the six points of the resolution. There is no, no to new conveyance.

<http://blogs.esanjaquin.com/san-joaquin-river-delta/files/2011/12/Deltaresolution.pdf>



**From:** Greg Zlotnick  
**Sent:** Thursday, December 22, 2011 11:37 AM  
**To:** 'Jason Peltier'  
**Subject:** RE: San Joaquin County Delta Stakeholders Coalition

Brent was involved with the development of this, which is why there's no "no" there.

Greg Zlotnick  
[gzlotnick@h2oesq.com](mailto:gzlotnick@h2oesq.com)  
Zlotnick H2O  
(c) 408-209-2844

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---

**From:** Jason Peltier [mailto:[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)]  
**Sent:** Thursday, December 22, 2011 10:29 AM  
**To:** T Birmingham (tbirmingham@westlandswater.org); Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'  
**Subject:** San Joaquin County Delta Stakeholders Coalition

I had not seen this.... We can agree with the six points of the resolution. There is no, no to new conveyance.

<http://blogs.esanjaquin.com/san-joaquin-river-delta/files/2011/12/Deltaresolution.pdf>

**From:** Walthall, Brent

**Sent:** Friday, December 23, 2011 6:12 AM

**To:** Jason Peltier

**CC:** T Birmingham (tbirmingham@westlandswater.org); Allison Dvorak Febbo; Ara Azhderian; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Creel, Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; Valerie Connor

**Subject:** Re: San Joaquin County Delta Stakeholders Coalition

Kern County supervisor Ray Watson worked on this and we helped him a bit. These 6 points reflect two years of intermittent discussions

On Dec 22, 2011, at 1:33 PM, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)> wrote:

I had not seen thisâ€¹. We can agree with the six points of the resolution. There is no, no to new conveyance.

<http://blogs.esanjoaquin.com/san-joaquin-river-delta/files/2011/12/Deltaresolution.pdf>